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MOTOR AGE

CHICAGO, JUNE 27, 1907
VOL. XI No. 26 PER YEAR $2

$2000

(F. O. B. Philadelphia)

The DRAGON Declares

that it has been "doing things" lately that put it away up to the front of the class of machines that cost a good deal more.

First, the 24-hour Point Breeze endurance run, where its two cars finished second and third, where every car that finished was higher powered and higher priced. Only three cars running when race was finished, and two were Dragons.

Second, the Boston (Readville) Decoration Day run, when the Dragon, finishing fourth, was the only car beside the winner that did not make a single stop for repairs or adjustments.

Third, that Dragon run over the 100 miles of ups and downs around San Francisco Bay in 3:26—23 minutes better than the previous record.

Fourth, the New Jersey Automobile and Motor Club's three-day endurance run from Newark to Atlantic City. Only five cars finished and the Dragon's consistent running throughout was a wonder; and this same car started for New York right after the race, made the 101 miles in 4:12—probably lowering the low-powered, four-cylinder record—and hurried back to Philadelphia without a break, hitch or stop.

The conclusion of the whole record is that the Dragon—Touring Car and Roadster—combines the great car qualities the average owner wants—**SIMPLICITY, POWER, STRENGTH, RELIABILITY.** These are the points that Dragon agents make sales on; and they are the points that the *Dragon manufacturers make good on.*

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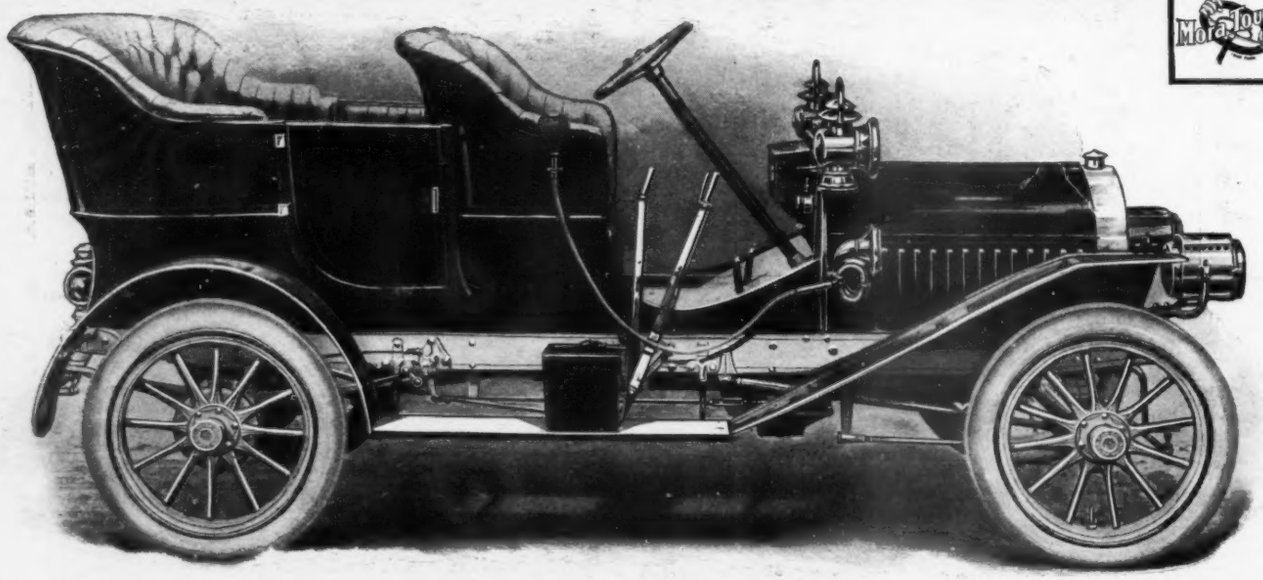

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Built to satisfy those who want a light, well constructed and designed Touring Car at a moderate price. It will go where big, high powered, heavy touring cars will go, with less tire trouble and at a lively pace. Because it is well built, of first class material and workmanship throughout, it is reliable, and upkeep expense is slight, with proper care. Wheel base, 108 inches. Weight, 1900 pounds. Horse power, 24. Price, $2200. With magnetic equipment, $2500.

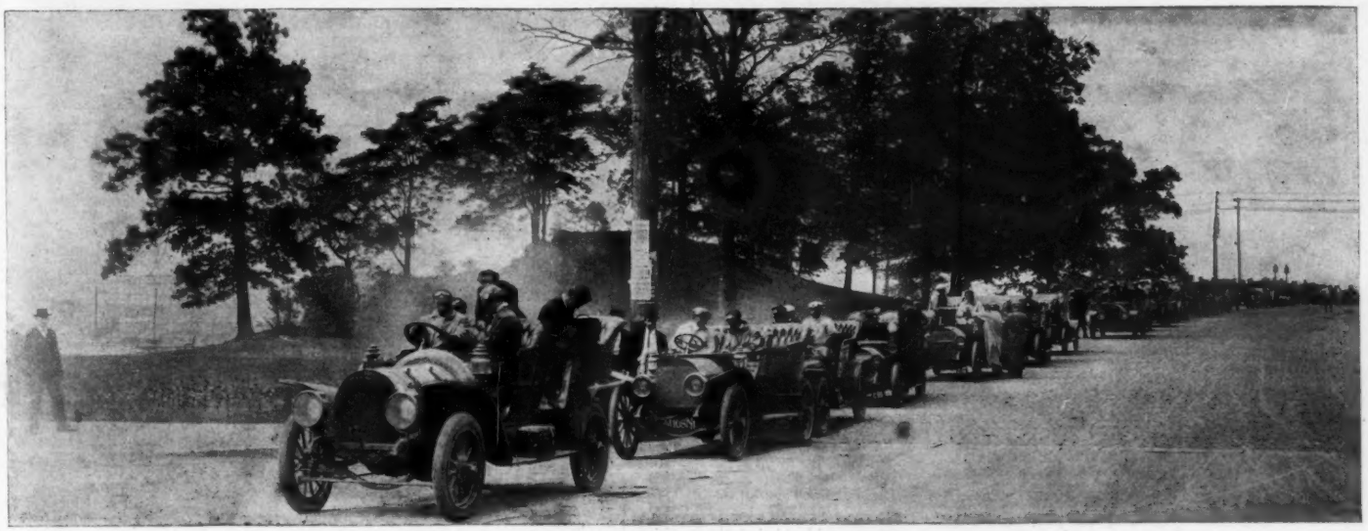
MORA MOTOR CAR COMPANY

20 Mora Place NEWARK, NEW YORK

VOL. XI NO. 26 CHICAGO, JUNE 27, 1907 PER YEAR $2

MOTOR AGE

FORTY-ONE SURVIVE SEALED BONNET TEST



LINE-UP OF THE CARS IN THE AUTOMOBILE CLUB OF AMERICA'S SEALED BONNET TEST AT MCCOMB'S DAM BRIDGE

NEW YORK, June 22—Forty-one of the forty-seven cars which started with bonnets, transmissions, batteries and tire boxes sealed on Wednesday in the A. C. A. sealed bonnet contest survived four consecutive daily runs of 150 miles each with seals unbroken. What the Automobile Club of America had framed up to be the most strenuous endurance test yet run over a moderate distance had panned out a task which a large majority of the contesting cars found quite easy of accomplishment. The result showed a surprising all-around excellence of cars of all classes when put to the test of running continouusly on the road without raising bonnets or resorting to the usual every-day adjustments.

To be sure the most favorable conditions of road and pace were encountered; but that so many cars should be able to run continuously so far with unbroken seals was remarkable, most creditable to their dependability, and most convincing to that portion of the public with the motor car bee a-buzzing in its bonnet.

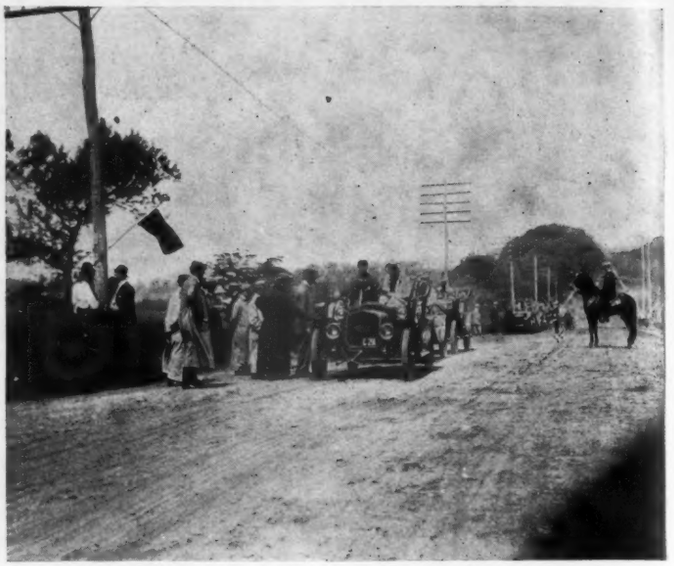
That the contest should be an out-and-out engine test and confessedly not such a slam-bang struggle as that resulting from the New York Motor Club's 208-mile run to Albany or the contest framed up by the Chicago Motor Club for this week the original routes for the daily runs were changed to embrace the best 150-mile stretches the New York vicinage could afford. The first and third day's runs were over the level sandpapered roads of Long Island, embracing a part of the Vanderbilt course and the famous shell roads of the south shore. The second day's jaunt was a bit more difficult, over some hills up Westchester way and into Connecticut, and the third was along the Long Island sound shore as far as Woodmont, Conn.

The Automobile Club of America in all its promotions is fanatically conscientious in the matter of speed limit observation not only in the open country but especially in passing through towns, several blue nose villages having besides been included on the itinerary. The schedule was set at a minimum of 7 hours 45 minutes and a maximum of 8 hours 15 minutes for the 138-mile timed portion of the course each day; for it must be understood that a timing control was set 6 miles out of town from the starting point at the A. C. A. clubhouse in West Fifty-fourth street. Stops for tire repairs did not count against the running time. Under this slow schedule the cars crawled through the towns and even in the open country for the most part ran no risk of overworking their engines in the contest.

START IN FRONT OF THE A. C. A. CLUB HOUSE

The sealed bonnet idea

STOP AT ROE'S HOTEL, PATCHOGUE, L. I.



NOON CONTROL AT DANBURY, CONN.

has been proved a good basis to start with, but the outcome of its first try-out would seem to suggest the wisdom of adding a bit to the strenuosity of the test by longer daily runs, more difficult routes or a time schedule with perhaps a combination of all of these three. One of the committee made the suggestion that the next test be over the Long Island parkway and that the winner be the first car to complete 1,000 miles without breaking a seal.

The eliminating rules, like the mills of the gods, ground slowly. The first day saw but one car put out and that rather by the forgetfulness of the driver than any weakness of the car. R. Howard, driver of a 30-35-horsepower Stoddard-Dayton entered by B. F. Dawson, a private owner, neglected to replace a missing nut on the steering wheel and did not notice it until after the start. Of course he had to put on a nut, of course the official observer reported it and of course the committee disqualified him.

The Columbia gasoline car with electric transmission, which was being given its first competitive test, had to raise its bonnet the second day to replace a broken intake valve spring.

Constant punctures and running with a flat tire broke the rim of the Glide the third day and put it out. The same day ignition troubles were the undoing of the De Luxe.

The casualties on the last day were more serious. S. B. Stevens, Jr., who was driving a six-cylinder Daracq, had the back luck to shear off a pin on the camshaft and the differential of a 50-horsepower Welch driven by E. L. De Camp gave way.

Under the rules every survivor is to receive a silver cup, so the A. C. A. is in debt to the infant sport and industry to the extent of forty-one of them. The club does not mind this in the least, though, figuring that its test was a success in that it demonstrated the all-around excellence of the modern motor car to the general satisfaction of the public.

CLASS A—$3,000 AND OVER

Driver	Type	H.P.	Car
P. J. Johnson	T	40	Berliet
H. C. Townsend	T	40	Berliet
H. Michener	T	40	Lozier
R. Mulford	T	40	Lozier
H. Mitchell	T	35	Locomobile
A. J. Bants	T	40	Locomobile
T. Beck	T	30	Locomobile
M. Roberts	T	60	Thomas Flyer
J. S. Williams	T	45	Pierce
R. Tucker	T	45	Royal Tourist
Joseph Judge	T	50	Pope-Toledo
W. C. White	T	30	White
H. K. Sheridan	T	30	White
J. A. Holme	T	35	Studebaker
N. M. Varney	T	30	American Mors
L. Potter	T	60	American Mors
F. Lescault	T	24	Matheson
E. Griffith	T	50	Darracq
L. R. Burne	T	50	Rolls-Royce

CLASS A—RUNABOUTS, $3,000 AND OVER

Driver	Type	H.P.	Car
R. G. Kelsey	R	40	Matheson

CLASS B—$1,500 AND UNDER $3,000

Driver	Type	H.P.	Car
E. C. J. McShane	T	35	Stoddard-Dayton
R. L. Newton	T	35	Stoddard-Dayton
A. M. Day	T	35	Elmore
J Florida	T	20	Locomobile
A. M. Robbins	T	40	Aerocar
C. S. Johnston	R	40	Continental
Phil Hines	T	30	Pope-Hartford
W. Folberth	R	40	Oldsmobile
A. E. Dennison	T	30	Knox
W. A. Bourke	R	30	Knox
J. Corbett	R	24	Corbin
H. Trecker	T	24	Corbin
A. Bailey	T	24	Corbin
W. H. Birdsall	R	24	Mora
C. B. Warren	R	30	Haynes
F. Cimiotti	R	24	Mora
Mr. Stickney	T	24	Mora
A. F. Camacho	R	40	Deere

CLASS C—UNDER $1,500

Driver	Type	H.P.	Car
H. H. Cole	R	24	Jackson
C. Fleming	R	12	Maxwell
F. Offenhauser	T	20	Maxwell

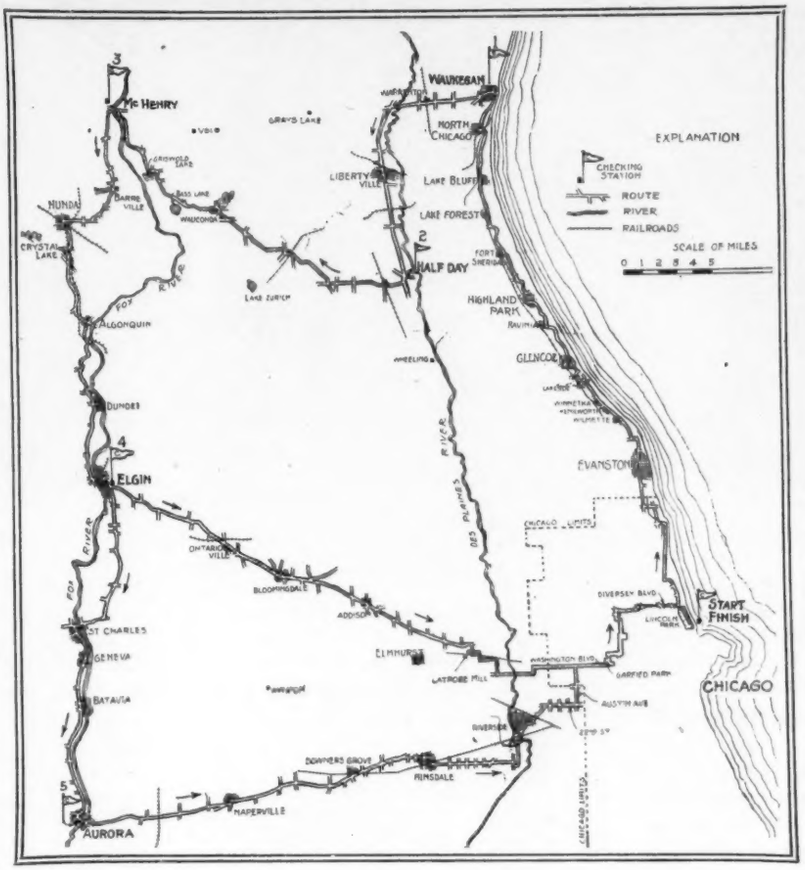
Undoubtedly the drivers who participated in the event were among the best in the country. Every man in it was a star, and he was on the job from start to finish. No attempt was made to scorch, for all realized that such foolishness was apt to bring their motors to grief, and all through the 4 days a sedate pace was kept up. Some complain that it was too monotonous to be pleasant; that not even the joys of touring were to be experienced, for the reason such great care had to be exercised to avoid possible penalizations. The roads were fine at all times and no complaint could be made on this score. It is more than probable the run will become an annual event, for the club is convinced it is on the right track and that a car that can travel 600 miles without breaking any one of the seven or eight seals placed on it by the committee is one that has certainly demonstrated its stability. That the makers like the idea is shown by the strong support they gave the club in this first effort. An even larger entry is anticipated by the club for the 1908 event.

TURNING POINT ON THE SECOND DAY OF THE TEST

MANY MAKES IN CHICAGO RELIABILITY RUN

CHICAGO, June 26—On the eve of the second annual reliability run, the Chicago Motor Club is anticipating even a greater success than last year, when the affair, then promoted by the Chicago Automobile Trade association, attracted eighty-eight entries, eighty-six of which started and eighty-four finished, thirty-four having perfect scores. This year ninety-five nominations have been received and the century mark could have been reached had the committee listened to the pleadings of the late ones. In this year's list there are fifty-one different makes of cars represented as compared with forty-five last year. There are twenty in class 1 for cars listing under $1,500; fourteen in class 2 for cars from $1,500 to $2,300; forty-seven in class 3 for cars over $2,300 and fourteen roadsters. In addition there are thirteen teams nominated for the team contests—the Pierce, Locomobile, Thomas, Haynes and National in the big class; the Dragon, Premier, Jackson and Maxwell in class 2, and the Ford, Maxwell, Jackson and Holsman in class 1. A team consists of three cars of the same make in the same class, one to be entered by a private owner and the dealer to declare his choices before the trial.

There are five six-cylinder cars in the test—two Fords, one a roadster; two Nationals and a Pierce. Twenty-one are two-cylinder cars and the rest four, not a single one-lunger being declared. The Knox, Frayer-Miller, Aerocar and Corbin represent the air-coolers, while the friction-drive contingent consists of the Lambert and Cartercar. Home talent is represented by the Silent Knight, Diamond T, Chicago Pullman, C-F, Holsman, Reliable Dayton and Staver. The three last named are of the buggy type, the Holsman being in with a team of three in the little class. Twenty-one makes of American motor cars which were not on last year's list appear—the Moon, Dragon, Matheson, Shoemaker, Wayne, C-F, Chicago Pullman, Royal Tourist, Pierce Racine, Corbin, Deere, Napier, Frayer-Miller, American Simplex, Gaeth, Diamond T, Craig-Toledo, Staver, Mora, Mason and Reliable Dayton. Those among the missing are the Apperson, Reo, Winton, Rainier, Stevens-Duryea, Orient, Elmore, Dolson, Cleveland, Halladay and Stoddard-Dayton.



ROUTE OF CHICAGO MOTOR CLUB'S RELIABILITY RUN

The contest is a sealed bonnet, non-motor stop event. The seals will be placed on hood and coil box and while it is permissible to stop the car the engine must be kept going. There is no penalty for taking on gasoline and oil, but water is prohibited. There are penalties for repairs and adjustments and every effort will be made to evolve a winner in each class, something that seems impossible in reliability contests this year. Two routes have been chosen, one of them 175 miles and the other 148. The cars in class 1 will go the short way. All start from the same place—Grant's monument in Lincoln park—and also finish there. They all go north to Waukegan, thence over to Half-Day through Libertyville; from there to McHenry by way of Wauconda, then to Elgin through Algonquin. At Elgin the little cars come home while the big fellows hike over to Aurora, which gives them 26 miles more.

CLASSY FIELD OF NINETY-FIVE CARS IN ANNUAL RELIABILITY RUN OF CHICAGO MOTOR CLUB

Entrant	Class	H P	Car
H. Paulman & Co.	3	65	Pierce Arrow Six
E. W. Macready	3	40-45	Pierce Arrow
Branstetter Motor Co.	2	30-35	Moon
Howard Hoopes	3	30	Haynes
Branstetter Motor Co.	2	24-26	Dragon
Knox Auto Co. of Ill.	3	25-30	Knox
Walden W. Shaw	3	40	Berliet
Andrew Ott	3	60	Thomas Flyer
C. A. Coey	3	60	Thomas Flyer
Branstetter Motor Co.	2	24-26	Dragon
W. K. Young	3	60	Thomas Flyer
Matheson Co. of N. Y.	3	50	Matheson
Maxwell-B.-C. Co.	2	16-20	Maxwell
H. C. Shoemaker	3	35-40	Shoemaker
Wayne Motor Co.	3	30-35	Wayne
Loco. Co. of America	3	35	Locomobile
Loco. Co. of America	3	20	Locomobile
Electric Vehicle Co.	3	40-45	Columbia
Ford Motor Co.	3	40	Ford Six
Cornish-Friedberg Co.	3	40	Aerocar
Cadillac Automobile Co.	2	20	Cadillac
Maxwell-B.-C. Co.	2	16-20	Maxwell
Maxwell-B.-C. Co.	2	16-20	Maxwell
Githens Bros. Co.	3	30	Stearns
Githens Bros. Co.	3		Oldsmobile
F. W. Cornish	4	30	C. F. Car
Cornish-Friedberg Co.	2	30	C. F. Car
N. R. New	2	24-26	Dragon
H. Paulman & Co.	3	28-32	Pierce Arrow
O. W. Lehmann	3	35	Locomobile
Pullman Motor Veh. Co.	3	45	Chicago Pullman
Jackson Automobile Co.	2	24	Jackson
Electric Vehicle Co.	4	24-28	Columbia
R. W. Cook	3	45	Royal Tourist
M. A. Mead	3	50	Pope-Toledo
Geyler & Levy	3	30	Autocar
Frank Nutt	3	35	Haynes
Pierce Engine Co.	3	40	Pierce-Racine
Bird-Sykes Co.	3	24	Corbin
Kline & Co.			Deere
Kline & Co.			Napier
Buick Motor Co.	2	24	Buick
Adams & Engs.	3	50	Frayer-Miller
W. G. Isbell & Co.	3	40	American Simplex
T. B. Jeffery & Co.	3	40	Rambler
Knight & Kilbourne	3	40	Silent Knight
Gilbert Hoxie	3	40-50	Berliet
Premier Motor Mfg. Co.	2	24	Premier
G. A. Weidely	2	24-40	Premier
Harold O. Smith	2	24	Premier
Chicago Auto Garage Co.	3	35-40	Gaeth
C. Winslow	3	30	Premier
Ralph Temple	3	75	National Six
Triumph Motor Car Co.	4	30	Triumph
J. B. Diebler	4	30	Haynes
W. P. Johnson	4	30	Packard
Ford Motor Co.	4	40	Ford Six
L. J. Reed	3	30-35	Simplex
Ralph Temple Auto Co.	3	50	National
Diamond T. Motor Co.	3	40	Diamond T
Ralph Temple Auto Co.	2	24	Jackson
G. E. Holmes & Co.	3	28	Queen
G. E. Holmes & Co.	3	28	Queen
Buick Motor Co.	3	24	Buick
Adland Motor Co.	3	35-40	Lambert
White Co.	3	30	White
W. C. Sears	3	40	Craig-Toledo
Moline Automobile Co.	4	20	Moline
C. P. Warner & Co.	3	35	Moline
O. F. Weber Co.	3		Pope-Toledo
O. F. Weber Co.	3		Pope-Hartford
Jackson Automobile Co.	2	24	Jackson
Mora Motor Car Co.	3	24	Mora
Knox Auto Co. of Ill.	3	40	Knox
Ford Motor Co.	1	15	Ford
W. B. Jameson	1	12-14	Maxwell
Maxwell-B.-C. Co.	1	12-14	Maxwell
Jackson Automobile Co.	1	24	Jackson
Jackson Automobile Co.	1	24	Jackson
Geyler & Levy	1	12	Autocar
Buick Motor Co.	1	22	Buick
T. B. Jeffery & Co.	1	20	Rambler
Holsman Auto Co.	1	10	Holsman
C. H. Bryan	1	10	Holsman
Holsman Auto Co.	1	10	Holsman
A. M. Brianza	1	15	Ford
Ford Motor Co.	1	15	Ford
Maxwell-B.-C. Co.	1	12-14	Maxwell
Ralph Temple	1	20-24	Jackson
W. Elsom, Jr.	1	20	Maxwell
Hagmann & Hammerly	1	20	Cartercar
H. B. Staver	1	18	Staver
Mason Motor Car Co.	1	24	Reliable Dayton

BIG MAXWELL-BRISCOE PLANT UNDER WAY

J. D. MAXWELL

LAYING THE CORNERSTONE

BENJAMIN BRISCOE

NEWCASTLE, IND., June 22—An epoch in the motor world was marked when the corner stone of the big plant of the Maxwell-Briscoe Motor Co.—said to be the largest in the world—was laid here to-day. It was a big responsibility to entertain a vice-president of the United States, play host to 15,000 strangers, including some of the important lights in the motor world, and superintend the laying of the corner stone of a plant of such magnitude, all in a day, but the 5,000 inhabitants of the City of Roses acquitted themselves in a most creditable manner.

Since last night all roads seemed to lead to Newcastle, and the two or three hotels were taxed to their full capacity, while citizens took strangers to their homes and treated them as brothers. Benjamin Briscoe, president of the company, and J. D. Maxwell, general manager, with some twenty-five or thirty of their stockholders, agents, newspaper men and friends, came here in a special car. Agents of the company came from all parts of the country, while motor car men who had no interest in the company at all, except from a brotherly interest in the business, flocked here from everywhere. It was really good to see Benjamin Briscoe play mine host in a double sense of the word, for Briscoe, with George W. Conner, of New York, purchased the Hotel Bundy a few days ago. Hence Briscoe had a double interest in seeing that everybody was happy, well fed and contented.

About 11 o'clock Vice-President Charles W. Fairbanks, who delivered the principal address, arrived from Indianapolis with George B. Lockwood and some friends.

Several hundred people came in motor cars from various parts of the state, taking advantage of the ideal roads in Henry, Hancock, Marion and adjoining counties. A large party of Indianapolis people, headed by Carl G. Fisher, the Indiana Maxwell agent, came over in Maxwells. One feature especially interesting was that prominent among the visitors were farmers who drove here in their own cars, participated in the parade and took such a hearty interest in all things motoring that some of the eastern guests, who are used to trap and shotgun receptions from farmers and rural constables, hardly could believe their eyes.

As the result of the efforts of the decoration committee, consisting of twenty-six of the city's leading business men, the city was alive with decorations. The thirty-five or forty factories were decorated and almost every dwelling and business house displayed flags and bunting in great profusion, while the roses for which Newcastle is famous seemed to be everywhere.

At 2 o'clock the parade formed and moved from the Henry county courthouse in the center of the city southward to the factory buildings, something more than a mile away. Motor cars, carriages and people on foot mingled together. At the head of the parade, in several Maxwell touring cars, were the officers and stockholders of the company and Vice-President Fairbanks.

MR. BRISCOE SPEAKS

Following were some fifty or seventy-five cars bearing prominent citizens, and farmers with their families, fraternal organizations in uniform on foot, a drum corps, bands of music and a long line of carriages.

At the grounds the speakers' stand was surrounded by a sea of people, who sacrificed linen and clothing willingly in order to remain during the addresses and exercises. The Junior Order of American Workmen placed the corner stone in position, which contained papers and documents that will be of interest to future generations of Newcastle citizens. Vice-President Fairbanks was introduced by E. H. Bundy, one of the city's leading citizens, who was instrumental in inducing the factory to locate here. Mr. Fairbanks spoke largely of the rapid growth of the city and of its promising future, due to the hearty co-operation of its citizens. "I wish to congratulate the people of Newcastle," he said, "on their neighborly co-operation and upon the spirit of push and enterprise which has resulted in securing the location and erection of this great industry. I wish to congratulate, also, the gentlemen who have come from the east to assist in the future growth and development of this progressive community. While I am congratulating Newcastle and our eastern friends, I also congratulate the state as a whole, for what benefits you benefits in a measure the entire state of Indiana, in whose honor and welfare we are each and all profoundly concerned."

The evening was devoted to banquets and a general celebration, in which the visitors were the guests of the Maxwell-Briscoe Motor Co. There was a banquet shortly after 5 o'clock at the Bundy ho-

tel, followed by a second 2 hours later in the same place. The large number of visitors made the double banquet necessary. Tonight a banquet to the visitors was given at the Country club and this affair was most elaborate.

It was rumored through Indiana last August that the Maxwell-Briscoe Motor Co. was looking for a western location, one in Indiana preferred. Practically every city of importance in the state laid plans to capture the plant and among them was Newcastle, a city of barely half the size of any of its competitors. On August 30 the first conference between the company and citizens was held here and a week later the local factory committee went to New York for further negotiations. The committee returned on September 13 and reported that conditions for obtaining the plant were favorable, if the bonus could be raised. A mass meeting of citizens was held on October 15, at which permanent committees were formed, and on November 8 another conference was held, leading to the signing of the $125,000 bonus contract by the industrial company which was formed by citizens for carrying the project through.

John Gubbins was given the contract for the foundation on December 22 and this was the first contract for construction work awarded. On January 18 the Pan-American company was given the steel contract and on March 8 work on the foundation started. This alone will contain 12,000 yards of concrete work. Pulse & Porter were given the construction contract for $148,465 and on April 22 the brick work commenced. Much of the factory walls are up and the work is progressing so rapidly that the 1908 model H Maxwell will be turned out in the new plant. Just how soon the factory will be ready for occupancy is not known, but it will doubtless be early in the fall.

Before a single car is turned out of the factory an expenditure of fully $800,000 will have been made. And the immense size of the factory buildings shows well

MR. MAXWELL'S EFFORT

where this money is being expended. It is said nine carloads of machinery are being held in readiness for shipment at a moment's notice, so with the completion of the buildings manufacturing can be started within a short time. About 1,500 people will be employed and the output of the factory will be 5,000 a year. A bond of $300,000 is deposited by the company to assure the citizens that it will carry out its contract.

The main factory building will be 722 by 311 feet, three stories high; the office building, two stories high, will be 50 by 75 feet, and the power plant 132 by 52 feet. Altogether the factory will have 307,000 square feet of floor space, or 7½ acres. The ground floor will have 160,448 square feet of concrete flooring.

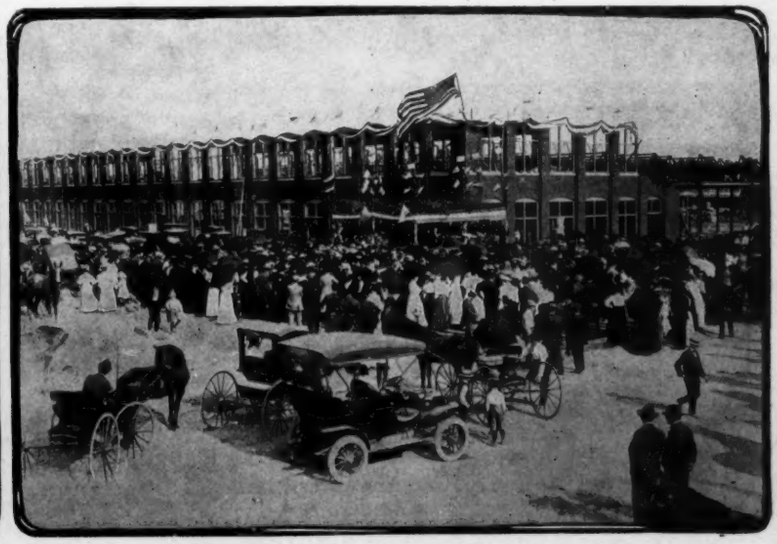
All of the various departments will have ample room in order to take care of their allotted work. Floor space to be used by the different departments is as follows: Repair stock room, 60 by 110 feet; stock room, 60 by 290 feet; receiving room, 60 by 60 feet; shipping room, 120 by 250 feet; finishing room, 60 by 126 feet; chassis painting room, 60 by 125 feet; trimming room, 120 by 126 feet; finish painting room, 120 by 126 feet; pattern shop, 60 by 126 feet; woodworking shop, 60 by 125 feet; motor assembling room, 60 by 126 feet; erecting rooms, 60 by 125 feet; motor testing room, 30 by 120 feet; general machine shop, 180 by 251 feet; frame and metal department, 120 by 251 feet; forge shop, 60 by 251 feet, and there will be two elevators, 9 by 18 feet.

For the convenience of the employes there will be a wash and locker room, 60 by 110 feet, and in this will be forty-nine sinks, each 2 by 10 feet, and 2,026 individual lockers. For testing purposes the plant will have a half-mile track, in the center of which will be an artificial hill. The receiving switch in the grounds will be 3,835 feet long.

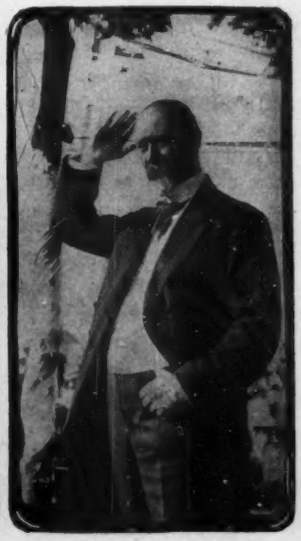
Some figures given out concerning material used in the plant caused considerable astonishment to-day. There will be 1,500,000 brick and 1,500,000 feet of lumber, to which must be added 1,250 tons of steel in the construction work. About 200 brick pilasters and 294 steel columns, 500 skylight trusses, 660 steel I beams and 300 trusses will be used. There will be 44,000 square feet of glass, seventy-two doors, 400 windows, 1,000 cubic yards of tunnels and 1,739 squares of roof. In building about 8,000 pounds of putty, 10,000 pounds of nails, 15,000 lag screws, 2,550 gallons of paint and 1,000 cubic feet of cut stone will be used.

Under the terms of the agreement by which the factory was located in Newcastle a site of 65 acres, valued at about $30,000, and an additional bonus of $90,000 on the factory buildings was given. On the 300 or more lots sold in the vicinity of the factory by the industrial company scores of houses are going up as fast as they can be built. When the employes arrive they will find new homes ready.

REAL LEMONADE STAND



BUILDING, SPEAKERS' STAND AND CROWD



VICE-PRESIDENT FAIRBANKS

ITALY SHINES IN KAISERPREIS

Eight Out of Twenty Finishers in Emperor's Cup Event Over Taunus Course in Germany Drive Fiat, Itala, Isotta Fraschini and Bianchi Cars—Race Details

Berlin, June 15—Honors in the emperor's cup race, run Friday over the Taunus course, went to Italy, the Fiat running first, fifth and sixth and the Isotta-Fraschini, Itala and Bianchi seventh, eighth, tenth, sixteenth and seventeenth. As has been cabled, Nazzaro in a Fiat won the race and got the kaiserpreis, whilt Hautvast captured the prize for the driver of the first foreign car after the winner. Joerns in an Opel, third, was the first German to come home. The final classification of the twenty finishers was as follows:

1—Nazzaro, Fiat, Italy.....5:34:26
2—Hautvast, Pipe, Belgium.....5:39:10
3—Joerns, Opel, Germany.....5:39:49
4—Michel, Opel, Germany.....5:49:35
5—Wagner, Fiat, Italy.....5:50:53
6—Lancia, Fiat, Italy.....5:51:01
7—Minola, Isotta, Italy.....5:51:15
8—Fournier, Itala, Italy.....5:53:18
9—Salzer, Mercedes, Germany.....5:57:33
10—Cagno, Itala, Italy.....5:59:12
11—Schmidt, Eisenach, Germany....6:03:01
12—Beutler, Martini, Switzerland....6:07:11
13—Jenatzy, Mercedes, Germany.....6:08:54
14—Rougier, Dietrich, France.....6:08:16
15—Beck, Martini, Switzerland.....6:20:14
16—Fabry, Itala, Italy.....6:29:05
17—Tommaselli, Bianchi, Italy.....6:32:45
18—Scholz, N. A. G., Germany.....6:35:33
19—Oelerich, Durkopp, Germany.....6:46:45
20—Adelberger, Protos, Germany.....7:13:08

As the eliminating trials had been run the day before the field had been sifted to forty. All but Jeannin's Sun car got away from the tape, the first machine leaving at 6 a. m. and the others following at 2-minute intervals. In the first round Poege's Mercedes was put out through the carbureter catching fire. From the start of the race it was a fight between the Fiat and the Pipe. Nazzaro and Wagner, however, landed the honors of the first lap, the former going around in 1 hour 23 minutes 50 seconds; Wagner, Fiat, in 1 hour 23 minutes 57 seconds; Hautvast, Pipe, in 1 hour 24 minutes 21 seconds; Deplus, Pipe, 1 hour 24 minutes 21 seconds; Joerns, Opel, 1 hour 26 minutes 25 seconds; Rougier, de Dietrich, 1 hour 16 minutes 42 seconds. Wilhelm's Metallurgique was put out by a broken wheel and Florio in a Darracq withdrew because of cylinder trouble.

In the second round the two Pipes made the best time, Hautvast showing 1 hour 24 minutes 2 seconds; Deplus, 1 hour 24 minutes 27 seconds; Joerns, 1 hour 25 minutes 38 seconds; Nazzaro, 1 hour 25 minutes 53 seconds; Fournier, Itala, 1 hour 25 minutes 53 seconds, and Opel, Opel, 1 hour 26 minutes 19 seconds. At this stage Hautvast led in gross time with Deplus second and Nazzaro third. Isen quit.

Lancia showed a flash in the third round in which he made the fastest time—1 hour 22 minutes 18 seconds—but it was Nazzaro who was the leader. He was only 22 seconds slower this lap than Lancia. Joerns did 1 hour 24 minutes 16 seconds, Hautvast 1 hour 24 minutes 30 seconds. Opel quit. Lancia again showed best on the fourth round, getting 1 hour 21 minutes 52 seconds. This was the final lap and Lancia's sprint came too late, for Nazzaro was only 11 seconds slower, which gave him the race. Joerns' last lap was done in 1 hour 23 minutes 30 seconds, Fournier did 1 hours 25 minutes 43 seconds, Wagner 1 hour 25 minutes 43 seconds and Michel 1 hour 26 minutes 17 seconds.

Twenty-four of the starters in the final were chain-driven cars and the remaining fifteen were cardanshaft. Of the winners fourteen out of twenty were chain-driven. Seventeen of the twenty cars finishing were supplied with make-and-break ignition. Twenty-two of the thirty-nine starters had a maximum bore of cylinder of 5⅜ inches and fourteen of these finished the race. Fifteen cars had bores of 5⅜ to 6 inches to their cylinders and only six finished the race. Thèry's Brasier in 1905 had a cylinder bore of 6 inches. These bare facts may appeal to those who are inclined to moralize regarding the technical lessons to be learned from the race.

The trials eliminated nineteen cars for Germany and left it but fourteen to continue an uphill fight against nine Italian, eight French, six Belgian, two Swiss and one British car. In other words, Germany had but 42 per cent of its starters qualify for the final, whereas Belgium had no less than 75 per cent, Italy 69 per cent, France 50 per cent, England 33 per cent and little Switzerland 100 per cent, the two Swiss cars both being classed in the final. The result was, of course, looked for in view of the inexperience of German drivers in particular. Gabriel's Lorraine-Dietrich was the only French car well placed, being fourth in the second lot of cars started. The remaining French cars were well down the list. Italy qualified nine cars out of fourteen starters. Nazzaro made the best actual time for two turns of the circuit. He did the 150 miles in 2 hours 50 minutes 20 seconds, at an average rate of 53 miles an hour. Wagner and Lancia, also of the Fiat equipment, brought home their cars practically at the same rate, for the average rate per hour for each was 51 miles, with 300 yards only per hour in favor of the dashing Lancia, who is classed at the head of the first series. Opel, Pipe, Itala, Lorraine-Dietrich and Mercedes cars also were well placed, but the eliminating trials deserve a story of their own, for the day has been full of interest from start to finish.

The emperor and his suite were there as soon as anyone, getting on the ground at 4 a. m. The roads were wet and slippery. The cars began to congregate at 3 a. m. and the roll call was made at 3:45 in accordance with the regulations. The first series was formed of thirty-six out of forty expected, plus three of the B series. Lancia took the palm for the fastest turn of the first round, doing it in 1 hour 26 minutes. This he repeated, with only 4 minutes extra, for the first turn.

At the end of the first round in the second series Nazzaro and Wagner led the dance, with speeds which have proved to be the fastest made in the day. Nazarro made the first lap in 1 hour 23 minutes 19 seconds, and Wagner was exactly 2 minutes 35 seconds longer. Nazzaro's time for the second turn was 1 hour 26 minutes 1 second. The final classing was: Nazzaro, 2 hours 50 minutes 20 seconds; Wagner, 2 hours 56 minutes 55 seconds; Deplus, 3 hours 1 minute 43 seconds, and Gabriel, 3 hours 9 minutes 45 seconds.

Many cars were abandoned because of broken wheels or steering apparatus, due to slipping on the greasy roads. Goebel in an Adler, wishing to pass a competitor, missed the turning at Eisch and overturned. His assistant, Yung, was killed on the spot and Goebel himself had both legs broken. A Horch car also overturned and seriously wounded its two drivers. The Martin-Lethimonnier car driven by Villemain also came to grief and Trucco and Burton of Mercedes fame overturned.

A. A. A. TOUR ENTRIES

Buffalo, N. Y., June 24—According to official word given out at the headquarters of Frank B. Hower, chairman of the A. A. A. touring board, there have been a great number of inquiries up to the present for entry blanks. It is believed there will be upward of 100 entries in the A. A. A. tour. Among the most recent entries for the Glidden trophy are: No. 22—H. H. Perkins, Pittsburg Automobile Club, 30-horsepower Packard; No. 23—H. C. Shoemaker, Chicago Motor Club, 35-40-horsepower Shoemaker; No. 24—W. M. Lewis, Chicago Automobile Club, 30-horsepower Mitchell; No. 26—A. Cuneo, New York Motor Club, 30-35-horsepower Rainier; No. 27—A. Kumpf, Automobile Club of Buffalo, 40-45-horsepower Pierce Great Arrow; No. 28—P. Gaeth, 35-horsepower Gaeth. The next entrant is No. 41, I. C. Kirkham, of the Westchester Motor Club, who will use a 16-20-horsepower Maxwell. The last unpublished entry is No. 104. The entrant is G. S. Smith, of the Quaker City Motor Club, who, it is announced, will contest for the Hower trophy. He will use a 35 horsepower Stoddard-Dayton car. It is said the Ford Motor Co. intends entering eight cars—six runabouts and two six-cylinder touring cars.

MAY CHANGE T. T. RULES

London, June 15—The latest idea is that as the tourist trophy race evidently has failed to secure the support of the British trade on its present lines it should be made a sort of sequel to the tourist trials of the Scottish Automobile Club. That is to

say, only those cars that have secured a certain standard of marks in the Scottish trials shall be permitted to enter for the tourist trophy. The idea is interesting, but scarcely practicable. The desire of the trade is to simplify, not complicate, the tourist trophy competition. It has been too intricate as it is and had led to nothing in particular because it has not been found to create any particular demand for winning types. The Scottish trials start on Monday, June 24, from Glasgow, the cars traveling by way of Loch Loncond to Arrochar, Inverary, Kellin, Aberfeldy, Bernam to Perth—160 miles—a hill climb being made en route at Glencoe. The second day's journey is via Blairgowie, Spittal of Glensher, Braemer, Banchovy, Stonehaven, Feller Cairne to Aberdeen—158 miles. The third day's run is via Kintore, Huntly, Dufftown, Grantown, Elgin, Forres, Nairn to Inverness, 160 miles. The fourth day is via Drummadvochit to Spean bridge and Kingnosie to Petlochvy, 155 miles. The fifth and final journey is via Aberfeldy, Crieff Collander, back to Glasgow.

RACE A STRENUOUS ONE

Paris, June 14—Long telegraphic reports of the already famous Pekin-Paris race have reached Paris and they tell of strenuous times for the hardy tourists who are on this 3,000-mile stunt. The cars started from Pekin on June 11, accompanied by all the foreign colonists of Pekin. Every one was unanimous in declaring that no car would be able to get even as far as Nankou, the first stage of the journey, distant about 30 miles. The traveling weights of the cars are as follows; Prince Borghese's Itala, 4,400 pounds; De Dion, 2,830 pounds; Contal, 1,550; Spyker, 2,830. The Itala car has a 40-horsepower motor, which gives 110 pounds per horsepower. The 10-horsepower De Dion has 300 pounds per horsepower, the Spyker over 200 and the Contal 240 pounds. For the passage over the soft mud and rocky districts it is estimated that a coolie will be needed for each 60 pounds. The cars have arranged to wait for each other at the end of each day's stage, and to return to look for missing ones. The first day three cars went astray and the others lost 3 hours searching for them.

RACING AT SEATTLE

Seattle, Wash, June 17—Barney Oldfield has been here and thrilled 'em and thereby in a measure redeemed circular track racing in the Pacific northwest. The Memorial day fiasco left a very bad taste in the mouth. But Oldfield went some, and the 4,000 people who saw him go at the Meadows Saturday were very much pleased. They saw a couple of track records set. In a 2-mile try Oldfield made the distance in 1 minute 56⅘ seconds, making the second mile in 57⅗ seconds. This creates a mile record for circular track. The Franklin and Tourist won the races outside of the matches.

RATINGS IN HERKOMER

Ladenburg's Car Wins Tour, But It Is a Benz, Not Mercedes, Driven by Erle—Details

Frankfort, June 13—Owing to the fact that Edgar Ladenburg, of Munich, had two cars entered in the Herkomer tour—a Mercedes and a Benz—and because Ladenburg always drives in the big event in a Mercedes there was a misunderstanding over the result of the German classic. Ladenburg won the contest, but it was the Benz car that carried off the honors. The committee announced Ladenburg as the winner and this caused some to credit the Mercedes with winning, whereas it was Erle in Ladenburg's Benz that received the verdict of the judges. After Erle came Aschoff in a Metallurgique, followed by Opel, driving an Opel car. A Mercedes car driven by Lingerke was fourth in the list. Benz, Adler and Opel cars follow in the order named. Among the next thirteen which receive a gold medal for not having been penalized were two Horch cars, two Opels, two Adlers, two Benz, a Germain, a Mercedes, a Napier—driven by Miss Dorothy Levitt—and Ladenburg's Mercedes.

The Benz car driven by Fritz Erle was one of the sixteen Benz cars in the tour and one of the biggest cars of that make. There was one other of the same size, the other Benz being of 20 and 36 horsepower. The winning car, which belongs to Edgar Ladenburg, the winner of the 1905 Herkomer, is rated at 46 horsepower and has a cylinder motor with the cylinders cast in pairs, 5⅘-inch bore and 5⅘-inch stroke. The car in order to win the Herkomer trophy had to do 54 miles per hour in the 3½ miles flat race in Forstenreider park and 28½ miles per hour on the Kesselburg hill. Erle is a Mannheim man, chief engineer in the Benz works. It was an open question until the last minute as to who should drive the Mercedes and who the Benz car, both belonging to Ladenburg. Finally Ladenburg chose the 60-horsepower Mercedes.

The majority of the cars in the tour had four-cylinder motors but there were some sixes—sixteen in all—of which two were Mercedes, three Steower, two Napier, one Belsize, one Vinot, two Minerva, two Achenberg-Hexe and one Clement. Four thousand dollars would represent the average value of the cars.

An enormous crowd of people witnessed the speed trials of the cars in Forstenreider park. No fewer than 144 cars took part in the race. The roads were slippery. The best time for the 5 kilometers measured course in the park was made by Poege in a 60-horsepower Mercedes in 2 minutes 51⅗ seconds, followed by Weingand, also in a Mercedes, 6 seconds later. One-fifth of a second slower was Erle in the Benz car. Ladenburg came along, also in a Mercedes, in 3 minutes 6⅖ seconds. June 9 was passed idly by the competitors, while the jury appointed by the town of Munich proceeded to make the beauty awards. There were various topics discussed over the lunch tables by the competitors on the tour which will replace the Herkomer in 1908. There must evidently be something arranged along lines similar to those of the Herkomer contest since the cars entered for this event prove that the popular character of the tour makes it desirable to retain in the yearly annals of motoring. It is stated that the Kaiserlicher Club will organize a tour to pass through Munich, Vienna, returning by Koenigsburg and finishing before the emperor in Berlin.

The stage between Munich and Augsburg, a distance of about 130 miles, was started June 10 by about 128 cars remaining in the tour. This stage included the dreaded Kesselburg climb which eliminated six or eight of the cars from the tour entirely. Flintz broke a wheele and Poege damaged his differential mechanism. The disagreeable part of the tour was the last stage between Augsburg and Frankfort, a rather dreary journey of 200 miles. One hundred and twenty-five cars were still left to crawl into Frankfort.

Hardly had the competitors time to examine their cars on June 12 and to discuss the events of the last stage with each other than it became known that only seventy cars stood any chance of being classed in the tour and of these some twenty were still in the locked garage awaiting inspection. On the arrival of the cars at Frankfort the competitors were welcomed by Prince Henry of Prussia.

ANOTHER DOUBLE CENTURY

Boston, June 26—The Bay State A. A. is completing arrangements for a 200-mile endurance run to take place here on July 8. The need of such a run has long been apparent to awaken the interest in motoring in this section. The route will be from Boston to Keene, N. H., and back. It will have to be stretched across country in a zigzag course to get in a few hills, but it can be done. The cars are to be divided into two classes, one for touring cars and the other for runabouts. Each car will carry its full complement of passengers and any violations of the speed laws or reckless driving will cause disqualifications. Cars must at all times be fully equipped as per manufacturer's catalogue specifications. In class A all cars carry at least four passengers of an average weight of 125 pounds. The runabouts can carry two or three people. There will be established a series of checking stations along the road and one of the newly planned rules provides that in case a car is late at a control it will be given a new running schedule for the next control so it will not have to race to make up time all along the route. The penalties will be inflicted because of mechanical troubles solely.

EIGHT CARS GO CLEAN

Half the Field in the Detroit Club's Annual Reliability Run Makes Perfect Scores

Detroit, Mich., June 22—The second annual reliability run of the Automobile Club of Detroit took place today over excellent roads and under conditions almost ideal. A total of fifteen cars competed in the three classes and, while the number of entries was greatly below the anticipated figure, due undoubtedly to the fact that many of the prospective starters were in attendance at the record breaking in progress at the 24-hour race on the state fair grounds track, the competition was excellent and the driving of a high order.

A schedule has been mapped out in advance, prescribing a route of 100 miles, and establishing controls to be reached at a time to coincide exactly with the legal rate of speed through the country traversed. The route led through Ypsilanti, Ann Arbor, Saline and Farmington and the finish was at the home of the club at Pine Lake not far from Pontiac. The start was from the Hotel Cadillac in Detroit and the cars got away at regular intervals.

Eight of the starters turned in perfect scores—an unusual feat when the difficult conditions are considered. President Edwin S. George, of the Michigan Automobile Association, was the first to start and led the rest over the course with a perfect score. It will be remembered that in the club's annual event last year there were many perfect scores, but it was thought this time there would be a winner evolved. But such was not the case, still no one is kicking, for all take it as proof of the general worth of the modern motor car and at the same time a demonstration of the ability of Detroit drivers.

But two accidents marred the progress of the event. One occurred on the Farmington pike. B. B. Tatham, who was driving an Oldsmobile and who had avoided all penalties up to that time, collided, head on, with a car driven by Leo Grabowski, also a member of the club, but who was not entered in the contest. The front wheels of each were smashed. Mr. Grabowski had turned out and stopped to allow Mr. Tatham to pass but failed to give him enough room. Neither driver was injured in the least.

Harry Berridge, a farmer, happened across the caravan somewhere near Orion. His horse became frightened and bolted, overturning the carriage and throwing out Berridge and the woman friend with whom he was driving. Telegraphic reports state that the woman's arm was broken. Following is the result of the scoring of the event:

CLASS 1—CARS $3,000 AND OVER

Driver and Car	Score
E. C. George, Packard	Perfect
C. A. Ducharme, Packard	Perfect
Willard Pardridge, Stevens-Duryea	6 min.
F. S. Welch, Welch	Perfect
A. R. Welch, Welch	Perfect

CLASS 2—CARS $1,500 TO $3,000

A. Y. Malcomson, Aerocar	15 min.
B. B. Tatham, Olds runabout	Disabled
George E. Lane, Wayne	Perfect
V. M. Gunderson, Northern	26 min.
T. Finch, Pungs-Finch	Perfect
F. G. Jacobs, Rapid truck	1:16
J. P. Schneider, Franklin	1:11

CLASS 3—CARS $1,500 AND UNDER

Stanley Brooks, Mitchell	Perfect
E. B. Brigham, Cadillac runabout	Perfect

IDEAL ROAD PLANNED

Bridgeport, Conn., June 24—From New York to Quebec over a stretch of splendid roads that would delight the most ardent motorists is something that will be possible in the east in the near future. What at first seemed like a chimera promises to become a reality. Connecticut plans to have a motor highway stretching across the state that will connect with the boulevards in Massachusetts. This proposed road is to be built so it will not touch the big cities or go through places where the traffic is in any sense congested. The parkway is to be capitalized at $5,000,000 and it is planned to have a toll of 5 cents a mile for touring cars and 3 cents for runabouts. The scheme has reached a stage where the legislature has been asked to grant authority to give the promoters right to take land by eminent domain to complete the boulevard. Reaching Massachusetts there are splendid highways to carry the tourist on to Boston and thence northward along the Merrimac valley to New Hampshire. The latter state has appropriated a large sum of money to build a highway through from the Bay State line to the mountains. Maine is improving its roads and from the White mountains to the Rangeleys it is proposed to widen and fix the roads. From there on through the woods to Quebec there is a splendid road north. The Glidden tourists last year found the route from Quebec through Maine one of the best of the trip. The old state highway to Canada is in fine shape and by making the connections it may easily be seen that a trip from New York to Quebec could be taken by the smallest runabout.

BELATED ORPHANS' DAY

St. Louis, Mo., June 22—Orphans' day was postponed by the Automobile Club of St. Louis from June 12 until June 19 on account of inclement weather. The day finally selected was ideal in every respect. One hundred and fifty members of the club contributed their machines, which were kept going from 9:30 a. m. until late in the afternoon. The cars assembled at the St. Louis Club on Lindell avenue, and were then sent under instructions from the committee to the fifty different orphan asylums. Upward of 2,000 children were given a delightful day's outing.

Buffalo, N. Y., June 26—Special telegram—Rain today prevented the celebration of orphans' day in this city by Buffalo motorists.

GOPHERS WHIZ UP HILL

Stanley Steamer Makes the Best Time in Minneapolis Climb—Stevens Shows Its Speed

Minneapolis, Minn., June 24—The hill-climbing contest held here June 19 was the biggest motor sporting event pulled off in the northwest so far this season. The test took place under ideal conditions, the weather and arrangements being perfect. Fifty cars participated and it was a case of "a good time was had by all." The course used is 1,522 feet in length and has a total elevation of 77 feet. In its course are two sharp curves which added zest to the contest. In spite of the curves, however, there was not an accident to either driver, car or spectator. The affair took place at Columbia Heights and several thousand people lined the road on both sides of the course. Police officers patrolled the hill and they kept the road clear for the contestants. The course was in good shape and in consequence considerable speed was displayed by the cars in all of the classes.

The best time of the day was made by a Stanley steamer, which zipped up the hill in just 23 seconds. A telephone service had been installed from the start to the finish and word was given at the start to the timers at the finish when a car was started. The best time for gasoline cars was made by a six-cylinder Stevens-Duryea, which made the course in 25 seconds, running off a tie with a Stearns. Both cars had made the climb in 27 seconds. Summaries:

CLASS 1—CARS $1,000 AND UNDER

Car and Driver	Time
Ford, Model R	:39 2-5
Ford, Model N, W. E. Wheeler	:40 1-5
Mitchell, D. C. Powles	:42
Mitchell, Ed Clark	:45

CLASS 2—CARS $1,500 AND UNDER

Car and Driver	Time
Jackson, Healey	:39 1-5
Buick, Charles Nyquist	:41
Buick, I. D. Tussey	:41 1-5
Buick, H. E. Pence	:47
Auburn, R. Douglass	:47 1-2
Auburn, R. Douglass	:48 2-5
Motor, W. A. Fox	1:06
Reo, —	1:07

CLASS 3—CARS $2,500 AND UNDER

Car and Driver	Time
Mitchell, F. Zerbies	:32 2-5
Rambler, Erne Simpson	:34
Cadillac, Fred H. Pfeifle	:34 4-5
Kissel, W. C. Rice	:36
Cornish-Frieberg, J. M. Murphy	:37 3-5
Mitchell, Ed Clark	:38 4-5
Buick, Charles Nyquist	:39
Mitchell, F. Zerbies	:39
Cornish-Frieberg, W. O. Larson	:39
Wayne, George Murphy	:41
Cadillac, Gus Ringlund	:42 4-5
Dragon, L. E. Choate	:51
Corbin, H. J. Mich	1:04

CLASS 4—CARS $3,500 AND UNDER

Car and Driver	Time
Pope, C. P. Joy	:28
Stevens-Duryea, H. E. Pence	:30
Haynes, Ed Noble	:30 4-5
Rambler, Erne Simpson	:31 1-5
Aerocar, Oscar M. Bergstrom	:33
Cadillac, Fred H. Pfeifle	:36
Stevens-Duryea, Charles Nyquist	:37 3-5
Mitchell, Ed Clark	:40
Wayne, George Murphy	:42 2-5
National, Robert Gallaher	:42

CLASS 5—FREE-FOR-ALL

Car and Driver	Time
Stearns, Joe Littlewood	:27
Stevens-Duryea, H. E. Pence	:27
Pope, C. P. Joy	:29

Packard, L. H. Piper	:29 3-5
Haynes, Ed Noble	:32
Aerocar, Oscar M. Bergstrom	:33 1-5
Cadillac, Fred H. Pfeifle	:34 3-5

CLASS 6—FREE-FOR-ALL ROADSTERS

Car and Driver	Time
Packard, R. C. Bagley	:32
Oldsmobile, Appenheim	:33
Mitchell, George Murphy	:37 3-5
Winton, A. C. Bennett	:38
De Luxe, E. R. Scheefe	:39
Blomstrom, Joseph A. O'Brien	:50

CLASS 7—STEAM CARS

Car and Driver	Time
Stanley, George Hilgers	:23

Tie run off by the Stevens-Duryea and Stearns cars resulted:

	Time
Stevens-Duryea	:25
Stearns	:28

TEST FOR OWNERS ONLY

St. Louis, Mo., June 24—The Automobile Club of St. Louis is arranging for a 65-mile test to be held some time within the next few weeks, the date not having been agreed upon. The contest will be open to owners only, and the test will be run over the streets of St. Louis and the roads of St. Louis county. The rules of the Glidden tour will be observed, and any contestant who violates the speed law, which is 15 miles in the county and 10 miles in the city, will be penalized by the club. The route selected is as follows: The start will be made from the St. Louis club, thence east to Grand avenue, south to Gravois, west to the Denny road in St. Louis county, thence to Kirkwood, Manchester, Bailey avenue, Olive street road, Link road, Jackson, St. Charles rock road to Bridgeton, thence to Parker, Spanish Lake, Bellefontaine, returning to the city at North Broadway and thence to the clubhouse via Ferry avenue, Florissant and Grand avenues. The county roads are in good condition at this season of the year. James Hagerman, collector of revenue in St. Louis, is in charge of the event.

NO CLIMB TO CLOUDS

Bretton Woods, N. H., June 24—There will be no climb to the clouds up Mount Washington this year as had been planned. When the climb through Crawford notch was substituted last year for the Mount Washington one it proved very tame and plans were made to resurrect the bigger event this year. As the only time to have it is in July and as there will be more interest in the Glidden tour then going on it was decided to let it pass by for the present. There has been some talk of a series of reliability trials here in October such as the Scottish trials in the highlands of that country every year. Something may come of that yet.

IMPORTERS' SHOW DATES OUT

New York, June 26—Special telegram—The Importers' Automobile Salon issued today its official announcement of the show it is to promote at Madison Square garden. The date is December 28 to January 4. Pleasure vehicles will be shown on the main floor, commercial vehicles will be exhibited in the hall at the right of the entrance. The galleries and concert hall will be devoted to sundries and parts.

BARS OUT MOTOR CARS

United States Government Forbids Them To Drive Through Beautiful Yosemite Valley

San Francisco, Cal., June 13—The deathknell of the motor car in the Yosemite has been sounded. "By order of the secretary of the interior," the gateways of the nation's most beautiful park have been closed, and no longer will the hoot of the horn and the song of the siren be heard in this paradise of modern days. It appears that somewhere in the government's big ledgers there has long been a law against the admission of motor cars to public parks, and it has finally been decided to enforce the regulation in the case of the Yosemite. During past years there has never been any objection to the use of the Yosemite roads by motor cars, and every year hundreds of cars have made the trip. When the order for the enforcement of the exclusion regulation was issued by Major Benson, superintendent of the park, the Automobile Dealers' Association of California was planning an endurance run to the valley. The reason for the exclusion is undoubtedly the narrowness of the mountain roads. In many places the road down into the valley is not broad enough to permit of the passage of two teams, and a misstep would mean death, for beyond the edge of the road there is almost a sheer drop of hundreds of feet. Although the number of motor cars going into the valley during the season is large, the ordinary traffic is, of course, the more important, and the government therefore has decided it must be given first consideration.

In past seasons, when motor cars have been permitted to enter the valley, they have been required to go in between 9 and 11 o'clock in the morning, or between 4 and 7 o'clock in the evening. In leaving they were required to depart between 3 and 7 o'clock in the morning or after 6 o'clock at night. These hours were so arranged that there would be the least possible conflict with the stages and other wheeled traffic. The speed limit was never higher than 8 miles an hour, and machines were held strictly to certain roads. During their stay in the valley motor cars had to be left at the hotels or camps at which their owners were staying. Cars were not permitted to run about the floor of the valley except by special permission of the superintendent.

In connection with the closing of the valley an odd coincident is noted. A photographer took a picture of the last car out of the valley, serving notice on the first car it met going in that the gates were closed. Both cars happened to be of the same make—Oldsmobiles—and there was therefore a bond of brotherhood and cordial greetings. The car coming out was that of H. O. Harrison, a dealer at Los Angeles, while the machine that was headed for the valley was that of Dr. W. A. Harvey, a member of the board of health of San Francisco. Both realized it was a sad day for the motorist, and proceeded to take pictures. Then Dr. Harvey woefully turned his car around and started out again, to seek pleasure elsewhere. That the beautiful valley is closed to motorists is regretted, yet all realize the danger as pointed out by the government officials, who apparently are taking time by the forelock.

OLD HOME WEEK PLANS

Boston, June 26—The city officials having in charge the celebration of Old Home week the latter part of July have set aside $1,000 for the motorists to use in arranging a 2 days' carnival in which motors will be a feature. Chester I Campbell, manager of the Boston show, is chairman of the committee having the matter in charge. At the meeting held Monday the question of features was discussed. There was some talk of a road race of 25 miles from Ashland to Boston on the plan of the famous B. A. A. marathon run, but the motorists decided the police would have too much to do to keep the course clear and because of the danger of accidents it was abandoned. It was finally decided that there would be a series of gymhkana contests which probably will be held on Boston common one day. There is to be a parade of decorated motor cars for afternoon and evening on another day.

MISSOURI REJOICING

St. Louis, Mo., June 24—The new motor law, enacted by the last general assembly of Missouri has gone into effect. Under this law the motorists are permitted a speed of 15 miles an hour in the country and 10 miles an hour in the cities. The most advantageous feature of the new law is that it makes one license, in addition to the local city license, good for all parts of the state. This license is issued by the secretary of state, and costs $2. Heretofore each county in the state was permitted to charge $2 for a license. The rigid enforcement of this old law made motoring in the state not only expensive but extremely hazardous. The new law is working like a charm, and it will have a tendency to greatly promote touring in the state. With the steady improvement of the public highways Missouri will soon become favorably known as a tourist's state.

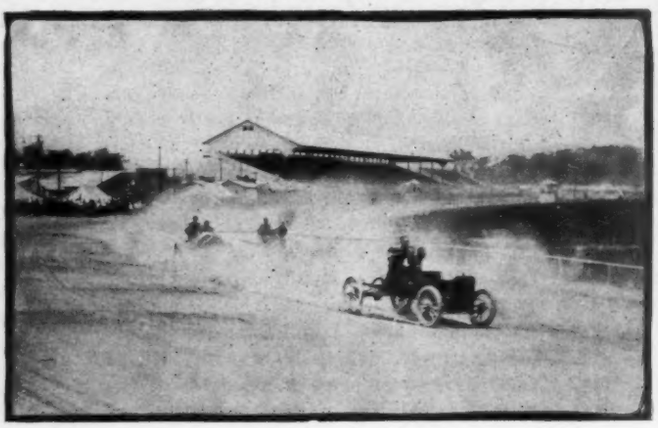
CHICAGO BUICK RUN

Chicago, June 24—W. J. Mead, manager of the Chicago Buick branch, conceived a happy idea when he thought of an outing for Buick owners. He put this idea into execution yesterday when he led a run from Chicago to Michigan City, Ind., and return, a distance of 112 miles. There were seventy-two Buicks in line, driven by owners and Buick agents in this vicinity. Outside of a few cases of tire trouble there was not a mishap on the entire trip and the emergency cars had nothing to do.

FORD SIX TEAM DOES 1135 MILES IN 24 HOURS

GAME DRIVES BY LYTLE AND COEY

BERT LORIMER



LORIMER IN FORD AFTER LAPPING GARDHAM AND LOHSE

FRANK KULICK

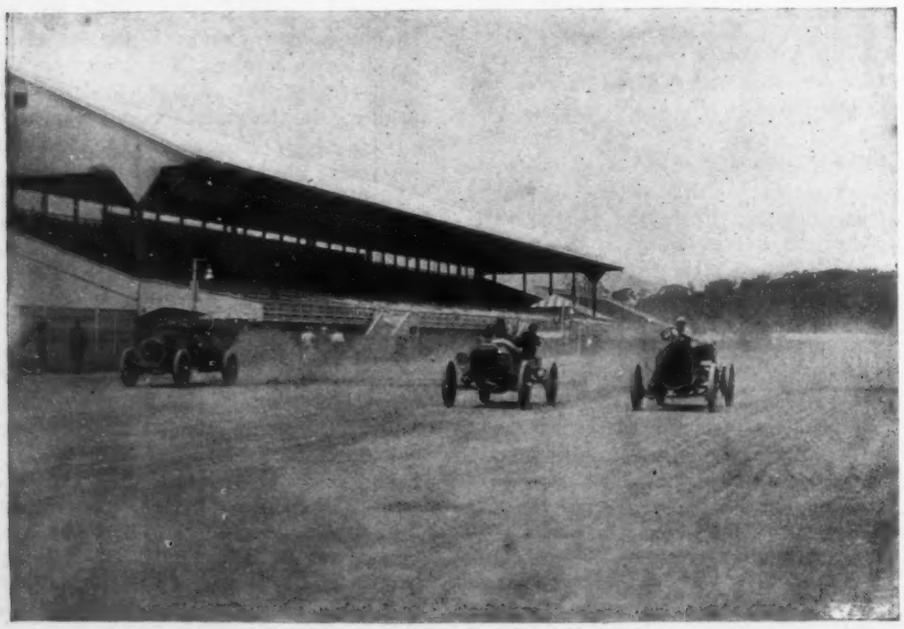
DETROIT, MICH., June 22—Nine teams started in the 24-hour track competition here Friday night and eight of them finished the gruelling contest. Of these six completed the journey ahead of any former competition marks for the day's trip, while the winning team covered the astonishing distance of 1,135 miles, an average of 47.29 miles per hour. The race was won by a pair of Ford sixes after the hardest sort of a battle with the Pope-Toledo team, which averaged but a mile an hour less than the winners and led through the first half of the race. The Thomas Flyer was third, while the Wayne was in fourth position. Creditable records also were made by the two teams of Ford runabouts and a Buick team. The last car in the race out of the eight which finished averaged around 30 miles an hour for the distance, so altogether the race was a marvelous contest.

The event, which was held under the auspices of the newly-organized United States Motor Racing Association, of which W. H. Pickens is the moving spirit, took place at the state fair grounds north of Detroit and started at 10 o'clock Friday evening. The track was partially lighted by a series of gas lamps and these, supplemented by the bright moonlight, made driving fairly safe. No sensational speed was expected during the hours on either side of midnight, but to the general surprise of the alleged wise ones, Herbert Lytle with his Pope-Toledo started out at a 1:10 clip before he had covered his first mile and a lively struggle was on immediately. Charles A. Coey, of Chicago, in a Thomas Flyer, and Eddie Bald in an American roadster accepted the challenge and the trio had a hot race for several hours. Coey, however, was out for an individual driving record and decided to save his energies for the long grind that was ahead. He accordingly left the task to Bald, who hung grimly to the Pope-Toledo for 4 hours, dropping only an occasional lap. During the fifth hour, however, the American was forced to stop for repairs and, with no relief car at hand, Bald and his partner—who was none other than Norman Selby, better known to the sporting world as Kid McCoy—decided to drop out. This was the only car of the field, however, to refuse the issue through the entire progress of the race. The American was running second at the time of the stop, although Lytle had then a clean lead of 17 miles over Bald.

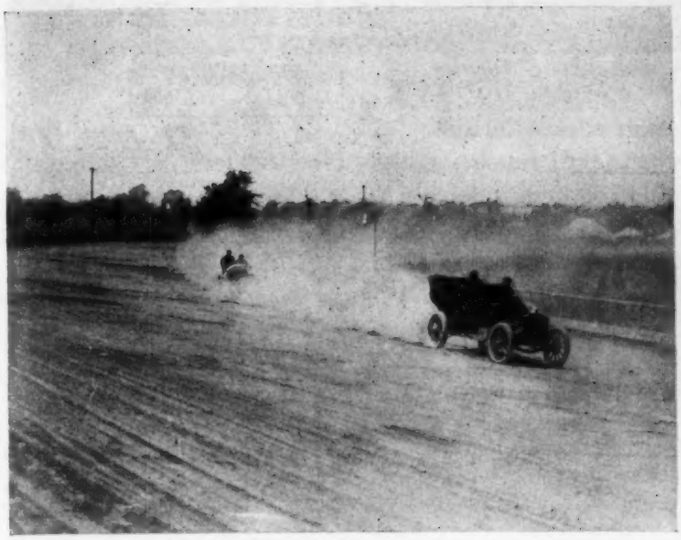
STATISTICAL HISTORY OF AN EXCIT-

Car, H. P.	1	2	3	4	5	6	7	8	9	10
Ford, six, 40	40	40	48	45	55	50	49	51	51	51
Pope-Toledo, 50	47	47	47	50	46	50	49	52	53	52
Thomas, 60	41	43	42	45	47	38	45	37	45	45
Wayne, 50	41	41	41	45	37	43	40	46	45	44
Ford run, 15	39	32	29	33	30	39	33	33	39	39
Buick, 24	33	37	37	35	31	34	37	24	29	38
Ford run, 15	29	31	31	31	26	30	33	30	27	31
Stevens-Duryea, 24	32	35	31	34	36	32	34	21	33	24
American, 40	46	40	44	44	22					

Henry Ford had counseled Frank Kulick, who started the event for the Ford six team, to keep to a schedule of 40 miles for the first 2 hours and this figure was observed to a dot. The second 2 hours were driven at a faster clip and the Ford was running third at the time the American dropped out. At this point Bert Lorimer, Kulick's partner, a driver hitherto of local reputation only, took the track. This was shortly before 3 o'clock in the morning and the small crowd which remained all night at the grounds was treated to some of the most daring driving ever seen on a mile track. Lorimer opened the Ford clear up on the long straights and speedily became a factor in the race. He took the curves high up on the banks and repeatedly negotiated miles in the even minute. Through the uncertain light of the gas lamps the car shot like a meteor, its exhaust an uninterrupted, flaming roar. Just 200 yards over 55 miles he completed during his first hour and the Pope-Toledo's lead had been cut



COEY, GARDHAM AND LOHSE ABREAST AT THIRTEENTH HOUR



COEY IN THE THOMAS RELIEF MACHINE

MONGINI'S MECHANIC ASLEEP AT 40-MILE SPEED

from 18 to 9 miles when Lorimer in the Ford six had completed the hour.

Lytle had been endeavoring at this stage to secure a bit of rest but was speedily summoned to the track to replace Lohse, his partner. Until 8 o'clock he and the alternating Ford pair did battle and the Pope-Toledo got back a bit of its lost

ING 24-HOUR TEAM RACE IN DETROIT

11	12	13	14	15	16	17	18	19	20	21	22	23	24	Tot.
51	51	49	50	47	51	46	49	43	48	44	44	39	40	1135
49	51	47	43	42	39	39	37	44	48	45	47	42	43	1109
46	46	46	45	38	40	42	40	39	39	30	41	30	40	990
43	40	39	35	45	39	41	41	32	40	40	41	31	28	958
35	35	34	32	30	32	36	31	28	31	28	33	33	34	793
38	30	31	16	31	34	32	34	38	26	30	29	19	29	752
27	25	36	36	31	35	36	29	32	32	28	27	26	29	728
26	31	34	21	27	33	31	34	29	35	18	29	37	15	712
														196

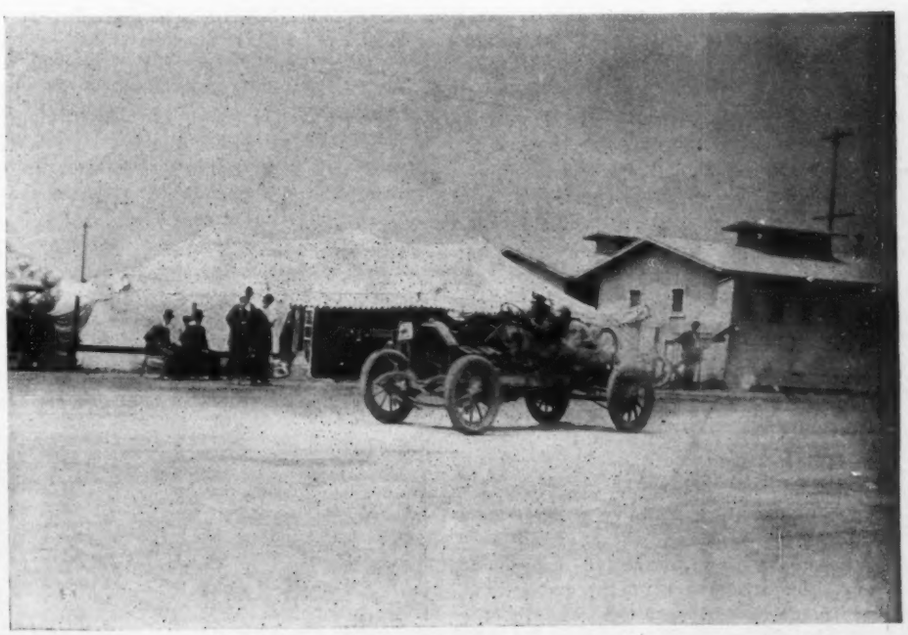
ground. At 8 o'clock, after 10 hours of driving, Lytle and Lohse led by 12 miles. At this juncture Lorimer started another wild ride. In 2 hours he reeled off 105 miles to the Pope-Toledo's even 100. During the twelfth hour Lorimer and Lytle drove together for 20 miles, alternating in the lead, fighting like quarter-horses. They did the 20 in 20 minutes 31 seconds, each of them bettering the minute-mile several times during the duel.

Both then resigned to their team mates and the pace slowed down a bit. Kulick, however, added a couple of miles to the Ford's climb in the next hour, and between 11 o'clock and noon made up the distance which at last brought him up to even terms with the white phantom. This brought Lytle back to the track again, the Pope-Toledo losing a mile in making the change.

Frantic at the loss of the lap and the steady rush of the Ford, Lytle made a thrilling attempt to pass the Ford at the lower turn, taking the pole while Kulick was plowing through the dust on top of the bank. Then something happened. The Pope-Toledo folk say it was an exploding tire. The Ford people say it was an attempt to force the six into the fence, which failed because Kulick refused to give ground. At any rate the spectators were horrified to see the Pope-Toledo skid and then tear down the bank and through the fence in a shower of broken planks and parts of the car. A rush to the spot found Lytle covered with dirt but uninjured save for several bad bruises and scratches, and shouting for his relief car which took the track immediately. He had been thrown out when the machine skidded and fell completely free of the wreck into the soft dust which the machines had dug up at the curve.

The accident, however, saw the climax of the race. The Pope-Toledo without a relief car, lost mile after mile and not until late in the afternoon, when the Ford had secured a lead of 36 miles, did a car, rushed over from the Toledo factory, arrive to help out. From this time on Lytle and Lohse gained steadily but the Ford team played safe through the rest of the contest and dropped to a general average of 43 miles, content to hold a reasonable lead. The car used by the Pope-Toledo team during the final hours of the event was the original 1907 factory model which had been tested over 22,000 miles of road last year. It was full of life, however, and its plucky but hopeless battle was the feature of the closing hours of the event. Both the leaders were together for the last mile and the Ford with Kulick at the wheel won out in the finishing sprint and with a margin of 24 miles to its credit.

A feature of the race was the game attempt of Charles A. Coey, of Chicago, to drive 1,000 miles inside the 24-hour limit. Coey failed but the failure was plainly the result of misfortune, as the big runabout in which he expected to drive the major part of the race developed a leak in the water jacket which would not yield to temporary repair and he was compelled to alternate in a touring car.



LYTLE PASSING POPE HEADQUARTERS AT 60 MILES AN HOUR

N.H.Van Sicklen, Manager

MOTOR AGE

Charles P. Root, Editor

Subscription Two Dollars a Year
Foreign and Canada Four Dollars

1200 Michigan Avenue, Chicago
Published Every Thursday by the Trade Press Company
Entered at the Chicago Postoffice as Second-Class Matter

New York Office
29 West Forty-Second Street

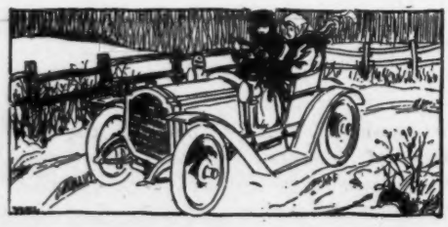
The Western News Company of Chicago and Its Branches Supply Newsdealers

NUMBERS THE ONLY FACTOR

UNACCOUNTABLE though it appears, the apparent desire of all promotors of motor car contests is to rival all others in the number of the entries that can be secured, leaving aside as apparently not worthy of consideration the question of real safety and a desire to declare a winner. Such has been the case in many of the reliability and endurance contests and tours, with the result, in some instances, at least, that these events have been robbed of much of what otherwise might have proved of material interest and value. The Herkomer tour in Germany this year was such a huge affair as to prove unwieldy and in many ways unsatisfactory, to say nothing of having the element of danger increased to a considerable extent. So far the annual tour of the American Automobile Association, now commonly termed the Glidden tour, has been anything but satisfactory to the touring board and other officials of the organization, and wholly because of the fact that fewer than thirty entries had been received up to the time Motor Age went to press. There is every indication that this number will be increased before the tour starts, but it is not at all likely the number will pass the half-hundred mark, whereas there were something in the neighborhood of eighty entries a year ago. The fact that the entrance fee this year is double that of last year is sufficient to assure a well-conducted tour, and if the entry list is held down close to the half-hundred mark the management can congratulate itself, inasmuch as this number of contestants will provide a contest that will be more than a wild scramble—something that will give pleasure and not be the means of making an extremely hard lot of work for competitors, officials, drivers and guests. Chairman Hower naturally desires a large representation, for he is probably like most other Americans and desires to make a record of his own; but if there are not over fifty entrants in the 1907 Glidden tour Mr. Hower will, after the affair is ended, sit down to think over things. Then it will begin to dawn upon him that, after all, the smaller number of entries proved a blessing he had not suspected—and the contestants will have similar ideas on the subject. There is difference between a real tour and some sort of a track affair, where numbers of entrants are necessary as an attraction in order to secure the attendance of the public, but there is no necessity at this stage of the motor car industry to resort to an immense line of cars winding its way through the country in order to tell the world that motor cars will run. Mr. Hower will probably have occasion before long to congratulate himself over what he may at this moment be worrying about, and he will have realized that, after all, there is more in conducting a clean-cut, sensible contest and a pleasure tour combined than in conducting a dust-eating scramble.

IS GERMANY LAGGING?

GERMANY is not, according to reports, so great in the motor car manufacturing world as it has been credited with being; if numbers are to be taken as a gauge, then Germany is far behind in the procession and is not only not holding its own but is losing ground. According to reports up to January 1 there were but 27,026 cars in the entire empire. What is more remarkable is that of this number 1,211 were commercial cars and 15,700 were motor cycles, leaving 10,115 pleasure cars. There is every reason to believe that these figures are wholly wrong, for they hardly exceed the number of pleasure cars in Chicago, to say nothing of New York city and a dozen or more of the states of the union. It is not reasonable to suppose that the fatherland, the parent of the motor car, has succeeded in disposing of only a paltry 10,000 cars on home soil and has been able to dispose of its immense factory outputs through other countries of the world. These figures are supposed to have been compiled by the German government, but they are so absurd as to make one believe that either some belittling news bureau or some clever American publicity man has been at work juggling the figures either as a joke or with a view to diverting trade. It is true France has always been far ahead of Germany in the manufacture of motor cars and in the last few years Italy has forged past the fatherland and is crowding France, while the United States has passed them all. But Germany is a country that has cheap but good labor, uses modern methods and it must be reckoned as a factor in the motor car commercial field not only at this time but for years to come.



GREAT WEST IS LEADING

EVIDENCE that the west is rapidly becoming the motor car manufacturing center of the country, if not the world, was strongly brought to the attention of the world when the corner-stone of the new Maxwell-Briscoe plant at Newcastle, Ind., was laid last week; and, as an indication of the importance that is now attached to the motor car and the motor car industry was the fact that the vice-president of the republic was the chief speaker on the occasion. It may be true that the vice-president, having higher political ambitions, took this occasion to appear in the limelight before the thousands that are directly and indirectly interested in one of the country's greatest industries, and incidentally to kill two birds with one stone by saying nice things to the farmer element in the country surrounding the plant that has been set down in an agricultural neighborhood. Whatever may have been the vice-president's motives, the fact remains that the second person in the land recognized the motor car, even if the first person has not publicly done so. Mr. Fairbanks is a politician, and this may account for the fact that at no time during the delivery of his address did he mention such words as "motor car," "automobile," "Maxwell" or "Briscoe." Perhaps he forgot it—and perhaps it was what a politician would call a clever move. There are hundreds of Newcastles all over the west and they are blessed with large amounts of energy and sufficient quantities of capital to interest other makers of motor cars and such things as go toward making up complete cars. They are looking for opportunities to interest capital, for they easily appreciate the fact that the middle west is a natural distributing point and that eventually the bulk of purchasers must come from the west. In all probability the east will be credited with investing more money in motor cars for some time than the west, but indications are rampant that the farmers—and merchants whose financial success depends upon the financial success of the farmers—are soon to form the great majority of the users of motor cars—and when this time arrives shipments will have to be made from the west and from the west alone. Detroit, Cleveland and Indianapolis are now entered in a hot race for supremacy in the commercial field so far as it relates to the manufacture of motor cars and they are supported by the smaller towns in their immediate and respective neighborhoods.

CHICAGO has done things in its usual way—in a rush and on a large scale. Its reliability contest, billed for Friday of this week, has ninety-five nominations, and had the committee having the contest in charge desired to have broken the rules it might have had the additional five without the least trouble. As to how this contest will compare with the contests held in the east remains to be seen, but the young Chicago Motor Club showed that it was capable of "doing something" even in its maiden effort. Without accident or any unpleasantness, the Chicago event ought to go down into history as something of an extraordinary nature.

FOLLOWING in the footsteps of New York, Detroit and Chicago, motorists of the Bay state and of Milwaukee have awakened and are to hold reliability tests, not alone to prove what motor cars can do, but to work in a little harmless sport and save up a few useful dollars, showing that road tests are popular and decidedly more attractive to the average motorist than are track events.

GOOD ROADS are coming—in some sections. A company with a capital of $5,000,000 has been organized for the purpose of building a parkway clear across the state of Connecticut and for the exclusive use of motor cars. True, the company proposes to charge toll for the maintenance of the road and incidentally for the purpose of giving a little dividend to the stockholders, but the motorists will not be likely to offer objections to this plan, for the toll could never amount to what fines and repair bills would under the existing conditions. Such an affair ought to prove popular in other parts of the country and to receive financial support from motorists. It is also recorded that eventually a road is to be built from New York to Quebec, avoiding the climb to Mount Washington.

THAT the dealer should cultivate his customers and do everything in his power to make them realize their interests are in common is plainly evident. But how many agents are awake to the fact? It is hard to say it, but there are agents who, as soon as the purchase price is paid over and is in the bank, forget the customer. In pleasant contrast to such conduct are recent examples of good fellowship shown in New York, Chicago and on the coast. In Gotham General Cutting gave a field day for owners of Oldsmobiles; in Chicago on Sunday Manager Mead of the Buick branch conducted seventy-two of his customers on a pleasure trip to Michigan City, Ind., and return, while on the coast G. V. Rogers, secretary of the Mitchell Motor Car Co., gathered together thirty-five Mitchell owners and gave them 3 days of pleasure in the way of a hill-climb and run. It is plainly evident that such a display of interest by the motor car representatives is bound to cement the ties that bind seller and user.

DETROIT has just been through a 24-hour contest that not only afforded interest to spectators, but resolved itself into a human endurance contest as well, inasmuch as one of the contestants, C. A. Coey, of Chicago, drove through the entire 24 hours with no relief except a period of a few moments while his car was being revictualed. There was some good driving, too, for the winner's Ford six-cylinder cars covered 1,135, an average of about 48 miles an hour, while their little brothers hopped over 788 miles during the same time. Twenty-four-hour contests ought now to be all the rage.

ITALY has not been four-flushing—it has been making good in every way so far as the motor car game is concerned. Its latest triumph came in connection with the emperor's cup race, when cars made in the sunny south of continental Europe captured first, fifth, sixth, seventh, eighth, sixteenth and twentieth places in the first score of finishers. Certainly Italy must be proving a long thorn in the side of France and Germany.

FARMERS in some portions of Indiana are not going around with loaded shotguns looking for motorists; instead, they have been made to realize the fact that the manufacture of motor cars is an industry second only to the manufacture of railroad equipment and can see wherein it may be of some use to a community. This was shown when the cornerstone of the new Maxwell-Briscoe plant at Newcastle was laid last Saturday. All Newcastle was there and there were hundreds of farmers in town for the occasion. The Newcastle farmer is not antagonistic to the motorist—he sees a little of the proposed prosperity of the community for himself and rejoices in it. At the cornerstone laying hundreds of horses were in evidence—perhaps their last stand, for a popular priced car made at home is apt to appeal to any farmer, and farmers are now pretty well able to own motor cars, as has been evidenced by the amount of country business transacted this season.

UNCLE SAM has such a high regard for the lives of his children that he has decided to shut the Yosemite valley to motorists on the ground that the roads are so narrow and the turns so dangerous that traffic with motor cars would be unsafe. In the vernacular, this is the limit—the idea of a federal government being compelled to close the roads in one of its few garden spots because of their frightful condition! But it serves to illustrate the fact that of all countries in the world deficient in the matter of highways ours is certainly supreme.

THE WEEK IN BRIEF

Italy is star in emperor's cup race, winning eight out of twenty places.

Successful hill-climb is held in Minneapolis, Stanley steamer making fastest time.

United States government decides to bar motor cars from the Yosemite valley.

Detroit holds reliability run in which eight of the fifteen starters go through with clean scores.

Importers decide to hold their show in Madison Square garden week of December 28-January 4.

Mixup over announcement of result of Herkomer tour; Ladenburg is winner, but it is his Benz car, not the Mercedes, that takes the plum; Erle is the driver.

Forty-one out of forty-seven cars go through sealed bonnet test of the Automobile Club of America without penalization; affair a glorious demonstration of the modern motor car.

Sensational 24-hour team race is run in Detroit, Ford six outfit winning and putting up 1,135 miles in journey twice around the clock; Lytle in Pope-Toledo is second and Coey in Thomas third.

COMING MOTOR EVENTS

GRAND PRIX—Second running of French grand prix, July 2; also sportive commission cup over same course.

B. S. A. A. DOUBLE CENTURY—Bay State A. A.'s 200-mile endurance run from Boston to Keene, N. H., July 8.

GLIDDEN TOUR—Start of Glidden tour from Cleveland, O., July 10; route through Toledo, thence to Chicago.

ARDENNES CUP—Automobile Club of Belgium's Ardennes circuit race, July 22.

LIEDEKERKE CUP—Automobile Club of Belgium's race for Liedekerke cup, July 23.

CHICAGO HILL-CLIMB—Second annual hill-climb of the Chicago Motor Club and Chicago Automobile Trade Association, Algonquin, Ill., August 1.

CHICAGO ECONOMY TEST—Second annual economy test of the Chicago Motor Club and Chicago Automobile Trade Association, September 5.

NEW YORK SHOW—A. L. A. M. show, Madison Square garden, October 31 to November 7, Marcus I. Brock, 7 East Forty-second street, New York.

SOME TRENDS of MODERN AUTOMOBILE DESIGN*

By Victor Lougheed

Part II

PROPER carburation is as essential to the satisfactory running of liquid-fuel motors as the present means of securing it are inadequate. Of all the carbureters that have been invented—and there are some 500 of them recorded in the United States patent office, not to speak of those exploited only in foreign countries—there is not one really capable in every respect of fulfilling engineering ideals of correct carburation. The great and good work that has been done by the designers of carbureters is not to be disparaged and all credit certainly is due to those whose struggles with carbureter problems have brought about the by-no-means-inconsiderable successes that have been achieved. But that there is still more to be done is a fact on the face of it and better than arguments is an illustration.

The last running of the Vanderbilt cup race on Long Island is estimated to have been attended by from a quarter to a half million people. Participating in this race were fewer than a score of cars—the best products of the foremost motor car factories of the world. Presumably these cars were equipped with the best carbureters that the progress of the industry has made it possible to produce and presumably their carbureters were adjusted and used in accordance with the best knowledge of the best qualified experts. Yet every one of the thousands of spectators was witness to the fact that all of the cars, from the beginning to the end of the race, save possibly for most infrequent intervals, spouted from their exhaust pipes continuous volumes of red and yellow flame—conclusive evidence to the veriest tyro in motor car engineering of mixture and combustion altogether bad. A correct mixture, it will be disputed by no one who knows, must burn with a pale-blue flame of great heat, but of practically no illuminating value, and, if combustion is complete when it should be, it will exhaust to the air with no appearance of flame whatever. So far, however, are even the best racing cars from approaching these ideal

THE FUTURE OF THE CARBURETER

conditions that such phrases as "fire-breathing monsters belching yellow flame," etc., have become classic in the descriptions of the great motor car road races held in this country and in Europe. All of which can and does mean only one thing—that the modern carbureter, even in its best forms, admittedly falls far short of doing all it should do to be ideal and is, moreover, an imperfect and inefficient mechanism, requiring if possible to be supplanted by something better.

OBJECTIONS TO CARBURETERS

In the following paragraphs an enumeration is made of the principal conceded objections to carbureters in general, with a view to defining the lines along which, in the writer's opinion at any rate, future improvement must proceed. Non-positive action of its different and usually numerous elements is a fundamental fault of most modern carbureters. The average carbureter is typical of what is commonly styled a non-positive mechanism. That is, it functions not by forced movements of its parts and of the fluids it handles, but does so rather by induced movements, caused by the indirect effects of cylinder suction. This suction acts, through various lengths of variously contorted piping, upon a liquid maintained in uncertain equilibrium by mechanism exceedingly likely to become inoperative, for all the conditions of use are adversely created by the movement of the vehicle—causing jolting, tilting, vibration and other factors practically insusceptible of control. Is it any wonder that here alone are found sufficient reasons for uncertain results?

Unsuitability for multicylinder engines is an increasingly apparent difficulty with carbureters. With multiplication of cylinders, as with innovations in fuel, the problems of the carbureter rapidly increase to a prohibitive extent. Fairly satisfactory with single-cylinder engines, carbureters become all but useless at a point considerably short of the cylinder multiplication nowadays deemed expedient by many well-regarded authorities. Four-cylinder constructions permit of at least an approximate equalization of the intake leads, and something similar is true in a lesser degree of eight-cylinder engines; but six-cylinder motors tax even the best carbureters to the limit, and make it almost impossible to secure from the different cylinders indicator diagrams with work areas not differing from 10 to 30 per cent from one another. Some constructors attempt to evade the problem by fitting two or more carbureters, dividing the cylinders into an equivalent number of groups, but between the attempt to feed many cylinders from one carbureter and the attempt to secure uniform results from a pulrality of carbureters, there is little to choose. Just as it has been found impossible to

EDITOR'S NOTE—This is the second of a series of articles on "Some Trends of Modern Automobile Construction" by Victor Lougheed; the third article will appear shortly.

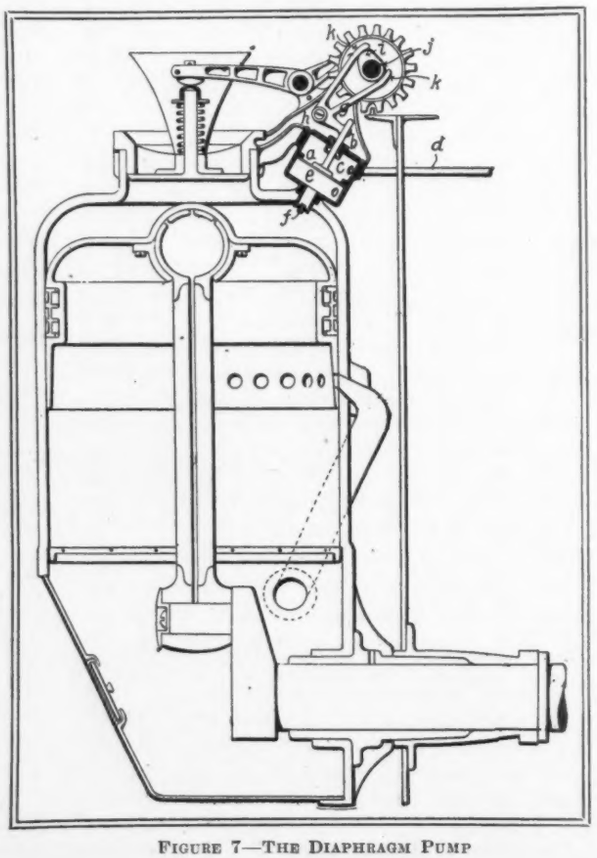


FIGURE 7—THE DIAPHRAGM PUMP

equalize intake piping effectively, it also is found totally impossible to adjust even two similar carbureters the same, and cylinders fed from different carbureters can be proved by manograph testing never to give exactly the same power except momentarily by pure accident.

Waste of fuel seriously reduces the practical efficiency actually realized, and is a stock defect with almost all standard carbureters. Even though a good carbureter be so designed as to keep an engine running with an absolutely minimum fuel consumption, there is sure to be the inevitable waste every time the engine is started after a stop—because of the necessity for priming, with consequent flooding and overflow of considerable portions of liquid. A similar waste is that from the carbureter after the engine is stopped, in case stopping is effected by cutting out the ignition, as usually is the case. In this condition there is apt to be overflow of very perceptible duration at the atomizing nozzle after the ignition is cut off, perhaps even accompanied by considerable dripping of the fuel to the ground. And a serious feature is that, despite the objections to the system of stopping by cutting out the ignition, it is the only system by which the cylinders are left full of mixture, to facilitate subsequent starting, whether by cranking or by manipulation of the ignition.

Impossibility of compensation is only reluctantly coming to be recognized by the foremost carbureter designers, many of whom are joining in a reaction away from complicated recent types. Pronounced examples are the Spyker cars of Holland and the Smith cars of this country, both of which have gone back to the old surface-carbureter idea of evaporating the fuel directly from a surface of it contained in a reservoir or chamber. Whether to maintain a fixed proportion or to provide definitely varied proportions of air and fuel vapor for feeding the cylinders, the desirability of some automatic or positive control over both fuel and air under all conditions has been widely recognized by designers. As has been suggested, there are some excellent and most irrefutable arguments against the prevailing theory that some particular proportion of mixture is right for all speeds and all conditions, but, be these arguments sound or not, there is little doubt of the advantages of positively controlling fuel proportions, whether to maintain or to vary them. Such positive control is not and apparently cannot be exercised with a carbureter. Undoubtedly some carbureters come nearer than others to producing a uniformly correct result, but the best is not perfect. As one cynic has it, "a compensating carbureter is one designed to give an imperfect mixture at all speeds"—a statement in which there perhaps is as much truth as humor.

The very nature of the carbureter problem precludes anything more than an approximate rather than a complete solution by the means now most favored. The multitudinous systems of increasing the air admission at the higher speeds make no pretense of compensating for more than a single minor fluctuating condition—the varying vacuum in the engine cylinder. And even for this condition compensation often is most imperfectly accomplished. As for varying fuel quality or kind—conditions that affect evaporation, specific gravity and power value; varying temperature, which also affects both specific gravity and evaporating quality; varying barometric

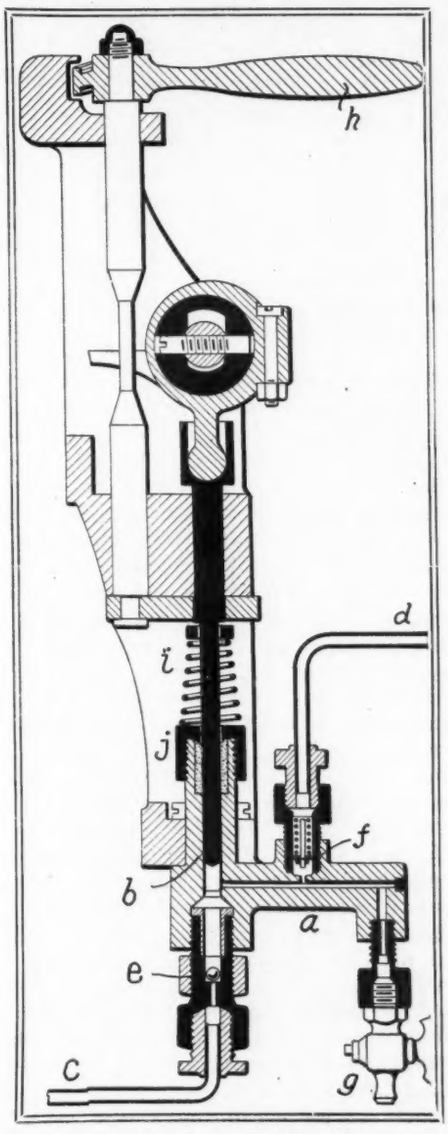


FIGURE 8—MIETZ & WEISS PUMP

pressure and altitude, which change suction, vapor tension and specific gravity; varying hygrometric conditions, and varying winds and drafts—little attempt ever has been made to relieve motor fuel-feeding devices of the untoward effects these phenomena may produce upon their reliability. Provision for warming carbureters in cold weather and for adjusting the fuel level to suit the fuel are not uncommon, but more often are crude evasions rather than real solutions of one of the weakest features of correct motor car practice.

Complication and cost, in the effort to secure partial compensation, have become the order of the day in carbureter building. Valves, levers, shutters, pistons, diaphragms, waterjackets, sleeves, springs, auxiliary air intakes and auxiliary-auxiliary air intakes are only parts of a complication so pronounced that it is almost impossible for even the expert to keep track of it. Yet the results achieved often are decidedly mediocre—being little, if at all, superior to those secured with the simplest of non-compensating carbureters, while the complication certainly makes definitely for unreliability. Indeed, next to the ignition, there is no more fruitful source of motor car troubles than is found in the average carbureter. A very large proportion of motor breakdowns and failures to run is attributable to the carbureters used, which in many cases require frequent adjustment of a character most difficult, especially for the novice. It is recognition of these facts in so many quarters which is reviving the simpler constructions for some time supposed quite obsolete, though in other directions there is the continued tendency toward increased complication. Good results, for example, are secured in some cases by the rather extreme expedient of fitting double carbureters—one to serve for low speeds and the other for high. Multiplication on a different basis is discovered in the recently patented Renault system of four carbureters for four cylinders, and in the older and now not uncommon system of multiple jets fed from a single fuel chamber.

Cold weather always is to be dreaded with the average carbureter, and the effect of this mechanism upon the all-weather reliability of the modern car constitutes one of the most serious counts in the indictment against it. Always beset by difficulties enough, the use of a carbureter in winter becomes at times a problem that may well appall the hardiest motorist. The fact that with a carbureter the fuel is evaporated in an attenuated and slightly cooled atmosphere, at some distance from the engine, causes it to exert a markedly refrigerant effect upon its surroundings. Even in fairly moderate weather, considerably above freezing, frost will form in most carbureters, while in real winter weather any moisture that is in the air or that may be in the fuel is condensed, frozen, and thus accumulated until it results oftentimes in a completely inoperative condition.

The most feasible plan for minimizing cold-weather troubles is to jacket the float chamber with water from the circulating system or with gases from the exhaust. Another common method is to take the air supply from the neighborhood of the hot exhaust pipe, in this way keeping the charges and the mechanism through which they pass warm enough to prevent freezing. The particular objection to preheating the air is that the consequent expansion reduces the volume of the charge that

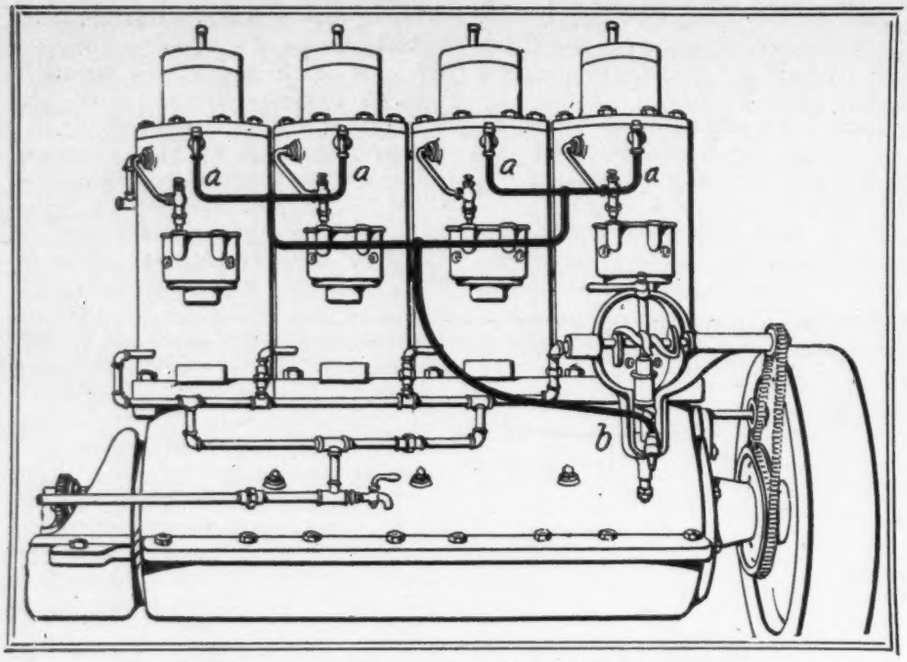


FIGURE 9—FUEL PIPE SYSTEM ON MIETZ & WEISS MOTOR

can be made to enter into the cylinder.

Trouble in self-starting is an almost inevitable condition when carbureters are used. A carbureter being a non-positive and indirect means of introducing fuel into the cylinders, its use in connection with a self-starting engine involves some auxiliary device for introducing the fuel or turning the crankshaft over, or requires that for starting dependence be placed upon fuel trapped within the cylinders at the time of stopping. Fair results are now secured, at the expense of a certain amount of uncertainty and complication, with many motor car engines, but such a thing as the infallible starting of a steam engine is not yet achieved with the more modern power.

Alcohol and kerosene carbureters are not nearly so satisfactory as are gasoline carbureters. Objectionable enough even with the most volatile gasoline, carbureters prove materially worse when it is attempted to work them with alcohol or kerosene. In fact, there to-day is no such a thing as an alcohol or kerosene carbureter thoroughly practical in all respects. With such as there are, preliminary heating or priming with gasoline is almost invariably prerequisite to proper functioning. The trouble with kerosene seems to be that it can not be vaporized at ordinary atmospheric temperatures, while alcohol absorbs water vapor from the air, to add to the considerable quantity it already contains in its ordinary commercial qualities. And this water, apparently, when handled at the temperature occasioned by the refrigerant action, cannot be vaporized and inspired as an ingredient of a properly compounded mixture.

PUMP SYSTEM OF FUEL INJECTION

One of the unanswered and unanswerable riddles of motor car history is that of how the carbureter ever came into such universal use while there existed so perfectly simple, reliable and altogether satisfactory an alternative as that of pumping the fuel directly into the cylinders by way of a small pipe passing through the cylinder wall. Heresy, undoubtedly!—but do the motor car designers who may express their disapproval of this idea really know what has been done with it? How generally is it realized that there are over 30,000 marine and stationary liquid-fuel engines in the United States alone, ranging from 1 to 150 horsepower, into which the fuel is fed by pumps? And is it widely known that many of these engines are perfectly capable of running continuously, with only the briefest attention every day, for months at a time? What possible objection is there, anyway, even in theory, to the pump system of fuel injection? Long experience in the stationary field, with which, unfortunately, most motor car designers are strangely unfamiliar, has proved it satisfactory enough in practice. As for theory, how well taken are the objections that have prevented the fuel pump from securing the extensive trial that is certain to be accorded to it in the very near future?

Is it that such small quantities of fuel as are required for each stroke cannot be pumped with precision? Both facts and figures disprove this. Consider, for example, a motor cycle engine of 2-inch bore by 2-inch stroke—about the smallest found in practical use. Such an engine geared ten to one to the rear wheel of a motor cycle will drive the machine 20 miles an hour at 2,400 revolutions a minute. Assume that 1 gallon will propel the machine 60 miles, and it follows that at 20 miles an hour the gallon is consumed in 180 minutes—the time taken by the motor to make 432,000 revolutions. In 432,000 revolutions there are 216,000 power strokes between which the gallon must be divided. A gallon contains 231 cubic inches, so each stroke calls for 1-935 of a cubic inch. And this is materially more than 1-1000 cubic inch, which is equal to a cube 1-10 inch square—a not at all inappreciable quantity. Moreover, all of the figures here given are extreme in their tendency to reduce the quantity of fuel to the stroke. As an actual fact it is probable that even the smallest motor cycle engine uses at least twice the quantity of fuel stated, while the consumption of fuel to the cylinder in the average touring car often is something like a cubic quarter of an inch to the stroke. And to meet the foregoing condition is the fact that there are thousands of successful pump-fed stationary and marine engines on the market, in which the fuel feed is controlled down to a 1-200-inch stroke of a quarter-inch plunger. Almost any motorist can recall occasions in his own or in other people's experiences when the carbureter, having proved stubborn or inoperative, the engine was got under way by priming directly into the cylinder through priming cups or the spark-plug openings. This is the pump system of fuel injection in a crude form.

Proved value in the pump system of fuel injection is attested by the extent of its application and the quality of the engines that employ it. The Diesel engine—the most efficient ever built—is pump fed and uses any liquid fuel with the highest success. The Mietz & Weiss people and the New York Kerosene Engine Co. both make pump-fed marine and stationary kerosene engines, notable for reliable running and for the thousands of them that are in regular use. The Hornsby-Akroyd, a famous and widely used crude-oil engine, is pump-fed. And the new Antoinette motors, with which the world's record motor-boat speeds and Santos-Dumont's recent flying-machine successes have been achieved, are pump-fed gasoline engines. Even in one well-known motor car, the Matheson, there is found the anomalous presence of a small plunger pump used to feed the fuel from the tank to the carbureter chamber—and, for priming—directly into the intake piping! This pump has not been redesigned during the 7 years it has been in use and gives no trouble whatever. In another car, the new Brush runabout, a diaphragm pump is used with excellent results for feeding the fuel to the float chamber.

Positive action and close regulation are important advantages of pump-feeding. By adjustment of the pump stroke, absolute and certain control of the fuel injection is afforded. This does away with all necessity for compensating mechanisms, such as are employed in carbureters. Compensating mechanisms for the most part exist to offset variable factors that are inherent in the very principle of the carbureter, so a cutting of the Gordian knot by recourse from carbureter to pump definitely solves problems that by other means can be only compromised. Mixture furnished by a carbureter varies with every change in engine

or atmospheric temperature, barometric pressure, suction, fuel quality, etc., and can be only approximately controlled by adjustment of all of these variables. Mixture furnished by a pump and an open intake valve is much less subject to disturbing influences and—of greatest importance—is positively controlled by mere manipulation of a single pump lever. This makes it especially satisfactory when power regulation is secured by variation of the fuel component of the mixture alone, as was suggested in the preceding article of this series.

Practically all of the successful pump-fed engines control by systems involving no variation in the air supply, thus exploding the widely entertained notion that mixture must be "correct" to secure results. The "mixture" theory is, in fact, in so far as the writer is able to ascertain, premised almost exclusively on the two series of experiments made by Clerk in England and at the Massachusetts Institute of Technology in this country. These experiments were chiefly with gaseous fuels, fired at atmospheric pressure, and reasonably established nothing more than that under the conditions named the most powerful results can be secured with mixtures containing about ten volumes of air to one of fuel. The range of combustibility, which is more interesting, was roughly determined at from five to one to fifteen to one.

But no experimentally proved data exist, that any authority knows of, from which a line can be had on the ignitable mixture range within a cylinder, under compression. It is certain, though, that compression tremendously increases the range within which ignition can occur and combustion become complete. This is proved in many highly efficient stationary gas engines that will operate perfectly on mixtures as lean as eighty to one! Even in an ordinary four-cycle motor car engine the many serious but little recognized disturbances of mixture proportions only mildly affect the operation. The retention of exhaust in the clearance, mentioned in the preceding article, is the chief of these disturbing conditions. With a good three-port two-cycle engine it is not unusual to throttle down to one-eighth of the charge volume used for full power. This implies that seven-eighths of the exhaust is retained—there being nothing but the displacing of the incoming charge to remove it. So, when it is considered that the fresh charge is—if "correct"—composed of one volume of fuel vapor to nine volumes of air, it is clear that the complete cylinder contents are made up of seventy parts of inert gas, nine parts of air, and one part of fuel vapor. This certainly figures out a seventy-nine to one mixture, in which the inert gases present must be even worse than an equivalent amount of air would be.

The Diesel engine affords interesting evidence here. This engine in its approved commercial forms is built with very little regard for the principle of variable fuel cutoff so highly prized in the Diesel patents. And no one ever saw a Diesel engine diagram with the steam engine flat top that its theory would indicate and its advocates claim for it. In fact, Diesel engines are controlled by the quantity of fuel admitted rather than by its duration of flow, and in them the injection and maximum pressure never continue for longer than the first tenth of the power stroke. This proves the Diesel engine to be practically a regular explosion—as distinguished from internal combustion—engine and that it is controlled by varying the richness of its charges. And if it be argued that the high compression temperature of the Diesel engine permits all this by facilitating quick evaporation of the fuel, then what of the Antoinette, the Mietz & Weiss, and other low-compression engines that operate on systems certainly more similar than the Diesel patents might indicate?

For a concluding argument along this line—which is worse, to encounter shadowy objections through the definite adoption of variation in mixture proportions as a means of control, or very real objections through the present system of controlling by variation in charge volume, which involves a consequent variation in compression? In this connection, and as a means of showing the uncertainty that exists even among supposed experts on this subject, it is interesting to note that Hutton, a widely quoted authority, naively implies as his objection to control by variation of mixture proportions that it gives "inflammable mixtures, but one so low in fuel that the stroke is a comparatively feeble one when the charge is ignited"—exactly what its use as a means of control requires that it do!

It may be urged that a pump injection of fuel does not afford the same certainty of thorough evaporation and complete compounding that commonly is regarded as insured by the use of a carbureter. But consider the conditions. With a carbureter the fuel is expelled from an opening 1-32 inch to 1-16 inch in diameter by a pressure certainly not greater than atmosphere—14.7 pounds to the square inch—into a comparatively cool and attenuated current of air at a point some distance from the cylinder. With a pump the fuel is injected from a closed hydraulic system through an opening from 1-60 inch to 1-100 inch in diameter and by a pressure that easily may be 1,000 pounds to the square inch into a highly heated—400 degrees Fahrenheit if only 70 pounds' compression is used—atmosphere under compression. Moreover, with a carbureter there is sure to be more or less condensed or unevaporated fuel on the walls of the intake piping, especially if less volatile fuels than gasoline are used, whereas with a pump such unevaporated fuel cannot lodge anywhere except on cylinder walls so hot as to vaporize it instantly. And as for the time element, is it not a fact that with many carbureter-fed, three-port two-cycle engines the fuel elements are aspired and compounded with 1-300 second?

High fuel efficiency is an obvious advantage of the pump. The fuel being injected into the cylinder with no ports or valves open, none of it can be lost, besides which there are modifications this system permits in functioning of engines to which it is applied, by means of which further efficiencies are certain to be secured. Among these modifications are the increased charge weight due to introducing the fuel into the cylinder as a liquid instead of as a vapor. In this way the space occupied by fuel vapor in an ordinary engine can be given up to air in a pump-fed engine, with the result that, the quantity of fuel being increased, a higher mean effective pressure is realized. Moreover, certain further ad-

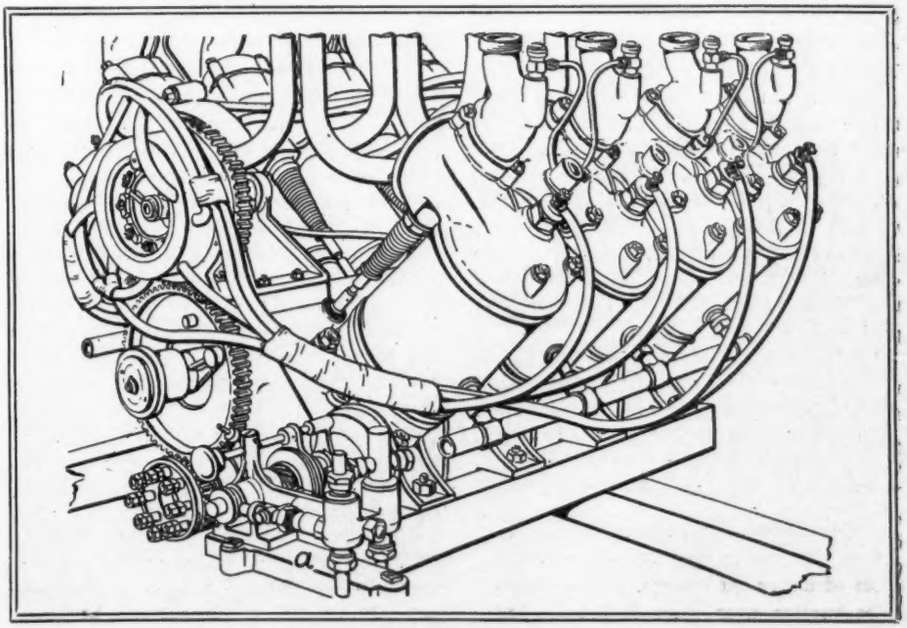


FIGURE 10—EIGHT-CYLINDER ANTOINETTE MOTOR

vantages can be shown to accrue as a result of the lowered initial temperature—a consequence of the cooling that must follow upon the absorption by the evaporating fuel of heat units from the air.

No intake piping is required with the pump system of fuel injection because, only pure air being inspired through the inlet valves, these can be left directly open to the atmosphere. This reduces complication and cost, and also affords a prospect of even more decided advantages, not the least of which is the possible elimination of the exhaust valve—a matter that will be discussed in a subsequent article of this series. High compression, which is so vital a factor in establishing high thermal and mechanical efficiency, is another condition readily realized with pump feed of fuel. With carbureter-fed engines, compression is limited by the risk of preignition, but with pump feed, ignition evidently cannot occur until the fuel is in the cylinder. Therefore, whether ignition be produced by normal or by abnormal means, its timing can be secured positively by timing the fuel injections, irrespective of the degree of compression employed. This ability to time altogether independent of any manipulation of the ignition means appears to be of very great advantage because of a bearing it has on the ignition problem. This will be further discussed hereinafter. Simplicity is a clearly established merit of the pump system of fuel injection. A thoroughly satisfactory pump can be made at a fraction of the cost of the simplest carbureter, and, once made, can be depended upon to function perfectly, practically without readjustment, for years. As will be obvious from the illustrations accompanying this article, most of the parts essential to such pumps as are required lend themselves readily to screw-machine production at small expense.

Application to self-starting engines is one respect alone in which the pump places the carbureter absolutely out of court. Beginning with elementary gas-engine principles, it can be shown that if a multicylinder internal-combustion engine has mixture in its cylinders—whether under compression or not—and ignition be produced in the proper cylinder, combustion will occur and the motor will start and take up its cycle. Infallible results in this manner, however, involve that the liquid fuel shall not condense out of the mixture and that the mixture shall not leak out of the cylinder, so only for stops not exceeding a few hours is this system at all reliable. Consideration of the conditions, though, discloses several prospects for taking the vital factors out of the realms of chance and placing them in the category of positive fulfillment. The most obvious but least satisfactory method is to crank the engine, either by hand or auxiliary power, with the ignition off. Then, when the cylinders are thus charged with mixture, manipulation of the ignition will start the motor.

The most practical method, possible only with the pump system of fuel injection, involves leaving the gasoline out of the mixture, so that when the engine is stopped its cylinders contain only pure air. With this condition self-starting can be produced at any subsequent time whatever by positively injecting a small spray of gasoline or alcohol into the cylinder, previously switching on the ignition. It is a well-established fact that mixtures ignited at atmospheric pressure will produce pressures often ranging as high as 95 pounds to the square inch, so if this system be applied it absolutely assures an impulse sufficient to start the engine unless functioning is so completely deranged that no possible amount of cranking could help it.

As for cold-weather starting—which is a serious problem with most carbureter engines—it is possible that this condition may be best improved by utilizing the ignition means to vaporize the minute quantity of fuel required for the initial impulse. Conceive, for example, a cylinder full of pure air, with the piston in effective starting position. Let it be assumed that a thoroughly reliable type of ignition device be used, not subject to derangement when wet by the fuel, and that there is a pump for introducing the liquid fuel. Now imagine that this pump is given a single stroke by hand, atomizing an exceedingly fine stream of gasoline directly into the cylinder and upon the ignition mechanism. Immediately some of the fuel at least must commence to evaporate, mingling with the air until a readily ignitable mixture is produced. Can absolute self-starting fail to ensue?

Multicylinder engine applications are as certainly a good field for the pump as they are a bad one for the carbureter. It is a demonstrable fact that there is not a multicylinder motor car motor made today in which all of the cylinders receive the same amount of the same composition of charge under any given set of conditions. Very fair approximate conditions are secured by the various systems of equalizing the intake piping, but the results are far from as perfect as with pump feeding, with which the injection to one cylinder is just as positive as that to another. It is understood, of course, that one pump, with a distributer, must be used for all cylinders, and not a pump for each cylinder.

All fuels that can be used at all in an internal-combustion engine can be used most satisfactorily in a pump-fed engine. All good kerosene and crude-oil engines, such as the Mietz & Weiss and the Diesel engines, are pump-fed. The same pump that will pump gasoline will equally well pump alcohol, kerosene, benzine, crude oil, or any other liquid, and though it is for the designers of engines to contrive means of overcoming the difficulties that surround

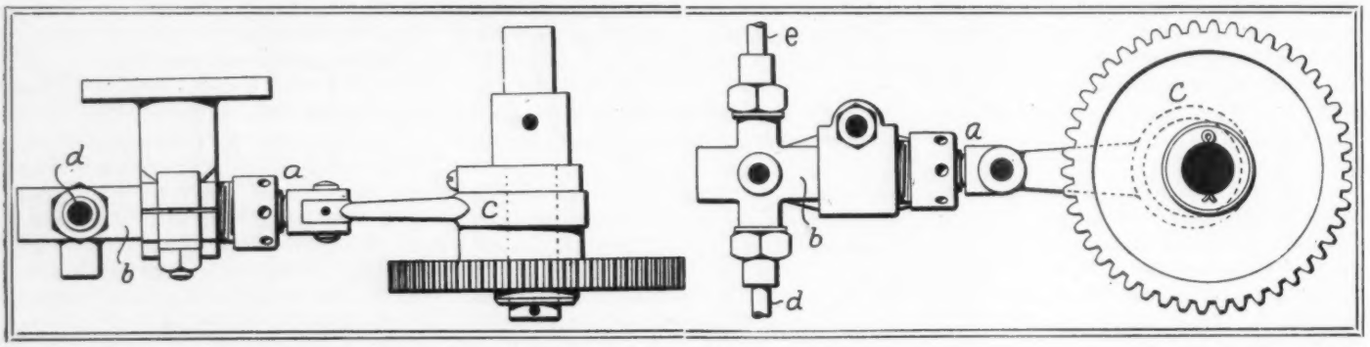


FIGURE 11 A — TWO VIEWS OF THE MATHESON PUMP — FIGURE 11 B

the proper utilization of these fuels, surely no better means than the pump of getting them into the cylinder, absolutely and infallibly, is likely to be found.

KINDS OF PUMPS

There are at least two kinds of pumps that can be utilized satisfactorily for pumping fuel directly into the cylinders of a liquid-fuel engine. One is the diaphragm pump, through which the liquid is forced by springing the center of a circular metal diaphragm, in a manner analogous to the action to the bottom of a common spring-bottom oil can. The other is the plunger pump, differing but little except in its smaller size from the ordinary plunger pumps widely used for forcing water against high pressure. Diaphragm pumps combine considerable advantages with considerable disadvantages. Their chief advantage lies in the entire absence of any openings along the sides of moving parts, whence the liquid might by any possibility leak to the exterior of the system. This advantage is less important than might appear, however, because close fitting and proper packing make any good plunger pump practically immune from

leakage troubles, even when used for the most penetrating, volatile fuels. A disadvantage of the diaphragm pump is that any variation in the pressure in the interior of the system produces flexions and bulgings of the diaphragm, whereby the quantity of fuel pumped may fluctuate without reference to the action of the controlling system.

A characteristic diaphragm pump for fuel feeding is pictured in figure 7, which is an illustration of a very light pump-fed four-cycle engine built for use in some flying machine experiments. This engine, of 4-inch bore and 3-inch stroke, is said to have run at the extraordinary speed of 6,000 revolutions a minute, at which rate it developed 1 horsepower for each 3 pounds of weight. Referring again to figure 7, a is the diaphragm and b is the stem by which it is actuated. The fuel flows from the fuel tank by way of the small pipe d into the chamber c above the diaphragm, and it leaves the chamber e below the diaphragm by way of the minute atomizing nozzle f. Suitable poppet valves of very small size control the passage of the liquid through the different parts of the pump. The rod b is oscillated by the bellcrank g, which is pivoted at h and given a to-and-fro motion by the cam i, mounted on the half-time camshaft j. It will be noted that the cam action is made positive by the use of the fork kk on the end of the bellcrank g, so no spring is required to supplement it. Plunger pumps permit greater variation in design than is possible with diaphragm pumps, and are likely to be rather more positive in action and more satisfactorily adjustable. The plunger pump illustrated in figure 8 is the one that has been used for 12 years on the Mietz & Weiss kerosene engines, of which many thousands from 3 horsepower up are in use. While these engines are not at all adapted to motor car use, this is because of no possible objection to the pump used, which is so constructed as to be perfectly reliable with any fuel. As is shown in figure 8 the Mietz & Weiss pump is very simple, consisting primarily of the cast-brass block a and the steel plunger b. The fuel is taken in through the pipe c, which communicates with the main tank, during the upstroke of the plunger, and on its downstroke is forced out through the pipe d to the cylinders. The small ball valve e effectively prevents return of the fuel to c despite the extraordinary small quantity handled in each stroke, and proves conclusively that a ball valve works perfectly under all conditions in a pump of this sort, unless possibly at very high speeds. Undoubtedly some fuel must leak back in seating the valve, but this leakage is certain to be a constant amount and therefore is simply allowed for by adjusting the pump stroke to whatever length is necessary to pump enough fuel to the cylinder.

The small spring check valve at f prevents the explosion in the cylinder from transmitting its pressure to the liquid in the pump, while the try cock g affords a convenient means of testing the pump by diverting its delivery. The plunger is actuated by an eccentric and its stroke is adjusted most minutely by the handle h, as shown. It is retracted by the spring i. The simple stuffing box j suffices to prevent all leakage along the plunger. A general view of a four-cylinder, two-cycle Mietz & Weiss engine is sketched in figure 9. The four fuel-feed pipes leading to the cylinders are at aaaa, and the pump is at b. This pump runs at 1,800 strokes a minute when the engine is at its normal speed of 450 revolutions. The feed pipes are of brass, about a quarter of an inch in diameter, but the openings into the cylinder are only about 1-60 inch in diameter, the large pipes being used to reduce the rapidity of flow and the consequent friction.

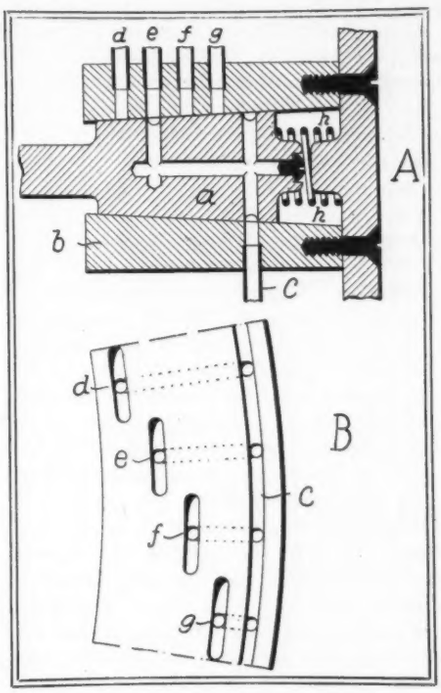


FIGURE 12—NEW DESIGN PUMP

The pump used on the Antoinette engines is sketched at a, figure 10. The details of this pump have been rather closely guarded, and so far the writer has been unable to secure them except in a general way. This pump is belt driven and apparently it has two cylinders—possibly double-acting to secure continuous fuel delivery. Since the pump as shown supplies eight four-cycle cylinders and the belt drive affords no means of synchronizing its operation in any fixed relation to the engine mainshaft, presumably the timing of the fuel injections is effected by the same means that distributes them to the different cylinders. However this may be, it is at least certain that the Antoinette engines run on gasoline with most wonderful reliability and efficiency, though in general construction they depart little from ordinary mixture-fed engines, except in their extreme lightness.

The Matheson gasoline pump is built as shown in the top and side views A and B, figure 11. In these a is the plunger and b is the cylinder, while c is an eccentric from which the drive is taken. The fuel enters from the tank by way of the pipe d and is ejected to the carbureter chamber by way of the pipe e. The pump plunger is 7-16 inch in diameter and makes a 7-16-inch stroke, passing through a cotton-wick-packed stuffing box, lubricated with oil. It is geared to run two-fifths as fast as the engine, so that it makes 500 pulsations while the engine is making 1,250 revolutions. Though no attempt is made with this car to pump the liquid directly into the cylinders, the use of this pump without change for 7 years proves that a plunger pump for handling gasoline is not in any way an unreliable device to have on a motor car.

For very high speed work it is probable that slide-valve pumps might prove superior to those with ball or poppet valves. A slide valve not only affords a perfectly positive action, but also requires no movement of the fluid to seat and close it. Therefore, its use should permit the closest imaginable measurement and regulation of the fuel feed. As for leakage, enough pressure could be easily maintained on surfaces in contact to avoid it.

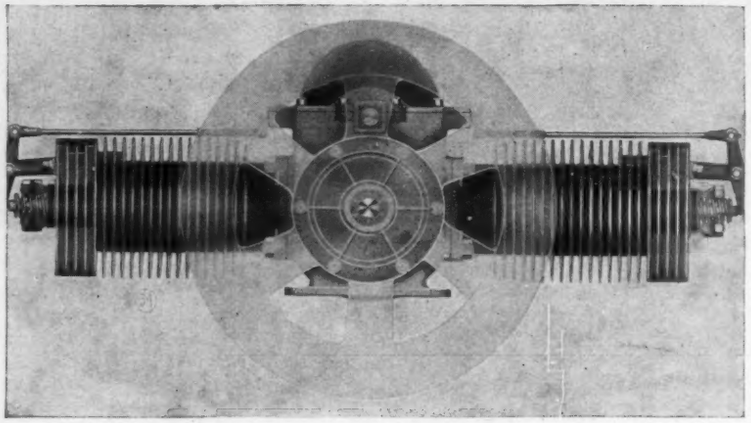
Distribution to multicylinder engines is an almost necessary element in any pump system of fuel injection applied to an ordinary motor car engine. It is undesirable, as has been suggested, to attempt the feeding of a plurality of cylinders with a plurality of pumps, because of the difficulty of adjusting two or more pumps to work alike. A much more practical plan is the use of one pump in connection with a distributing device. Such a device, of a construction patented by the writer, is illustrated at A and B in figure 12, in which a is a rotating taper plug, contained in the non-rotating block b. The fuel comes from the pump through c and reaches the four cylinders through d e f g, one of which at a time is in communication with c, by way of the grooves in the surface of a. These grooves would present the appearance shown at B in figure 12, could the surface of a be taken off and laid out on a flat surface. The rotation of a is effected, of course, between pump strokes, so that it is stopped in position to feed one of the engine cylinders during the entire duration of the injection stroke. The position shown in figure 12, for instance, is such as to feed through pipe e.

A slight end pressure maintained on a at all times by the spring h is sufficient, in connection with close fitting, to prevent leakage, and close fitting is insured permanently by the tendency of a to grind itself constantly into better seating as it continues in use. An ordinary brass faucet, which will hold gasoline without the least leakage, affords in its construction a very close and common analogy to this tapered seating of metal-to-metal surfaces, held in contact by a spring.

MOTOR CAR DEVELOPMENT

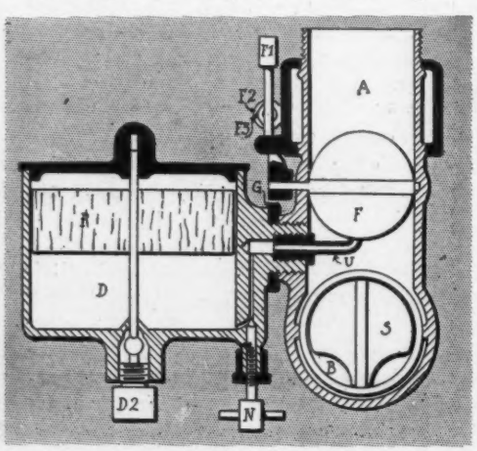
Two New Reeves Motors

TWO new motors, a two-cylinder air-cooled opposed and a four-cylinder vertical, are the latest offerings of the Reeves Pulley Co., Columbus, Ind., which concern for several seasons has devoted considerable attention to motor car engines. Model L, the trade name of the four-cylinder style, has a rating of 22-24 horsepower, its cylinders having a 4-inch bore and 4-inch stroke. This motor, intended for medium-powered and medium-priced runabouts, is a conventional design with separately-cast cylinders, valves in the bottoms of chambers on the left side, a two-piece crankcase, with integral supporting arms on the upper half, enclosed timing gears at the forward end, one-piece intake and exhaust manifolds secured to the cylinders by four yokes, one for each cylinder, one end of the yoke holding the intake manifold and the other securing the exhaust, and water circulation by pump carried at the left front delivering its current to the waterjackets at the right side, the return flow starting from the top of the waterjacket crown. All parts of the motor are made on prepared jigs and templates, so they are interchangeable and may be procured promptly. The crankcase is all aluminum, the upper half carrying all bearings and the lower half the oil, the lower half being easily removed after the engine is mounted in the chassis, without disturbing any other parts. The cylinders are cast from gray iron and bored, reamed and ground to a finish. The crankshaft is hammered from a solid billet of specially tempered steel, turned and ground. The bearings are all die-cast interchangeable bushings, made of special bearing alloy and hand-scraped to a true running surface. The pistons are made from gray iron, turned and ground to fit the cylinders, and are fitted with four eccentric expansion rings. To illustrate one of the niceties of workmanship, these rings are split and reground to insure a continuous bearing on all parts of the cylinder wall. The valves are drop forged in one piece and ground, and are interchangeable and mechanically operated. The waterjackets have been designed to provide an ample body of water at the exact part of the cylinder needed, and acts not only for the purpose of cooling, but deadens the noise of the valves so the engine not only keeps cool but runs quietly. The motor viewed from either right or left side is a graceful-appearing power generator.



REEVES' MOTOR FOR HIGH-WHEELED MOTOR CARS

The two-cylinder motor marked model N has been designed specially for the high-wheel or buggy runabout, its two air-cooled cylinders with 4-inch bore and 4-inch stroke having a rating from 8-10 horsepower. This motor has a cubical gray iron crankcase with end plates for taking the crankshaft bearings and to its opposite sides are bolted the cylinders. The top is a removable cap between which and the crankcase proper are carried the bearings for the camshaft as well as the guides for the push rods. Making the fly wheel with six fan blade spokes has done away with the necessity of a fan. Valves are carried directly within the cylinderheads, being opened by short vertical rocker arms centrally supported on an arm extending from the head, and operable by a push rod lying along the top of the cylinder and connected at its other end to the valve rocker and at its inner end to an elbow on the push rod. Valves are 35 per cent nickel steel and are ground to fit the interchangeable and removable castiron valve cages. Cooling is by integral circular flanges around practically the entire length of the cylinders and continued on that portion of the cylinderhead receiving the valve cages the flanges in this latter part being considerably higher than those on the cylinder walls. The valve lifters are case-hardened steel and are provided with timing adjustment on the push rods. The crankshaft, hammered from a solid billet of specially-tempered steel, is turned and ground to size and the bearings carrying it are die-cast interchangeable bushings of a splendid alloy which is hand-scraped to a running surface. A ground finish is imparted to the cylinder walls, pistons and piston rings. This motor may be set lengthwise or crosswise of the car and the transmission appliance connected with either end of the crankshaft, and may be manufactured to run either direction. The motor is of sufficient length to fit the regulation buggy motor car in every possible respect.



SECTION OF HALL CARBURETER

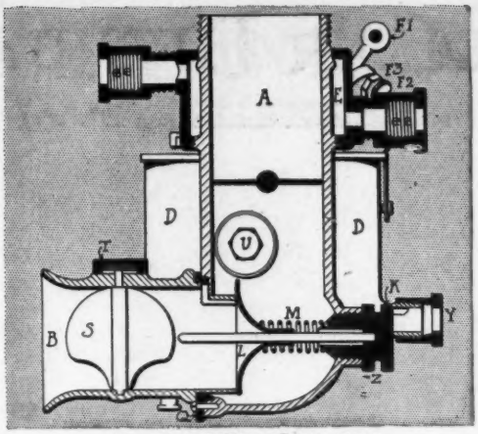
COLT SIX RUNABOUT

The Colt is built on very fast lines, with ample clearance and low center of gravity. The body has no rumble seat, the short rear end being utilized for carrying a 20-gallon gasoline tank, tools, extra parts and tires. A detachable mechanican coat is located on the left hand running board. The wheelcase is 105 inches, a very desirable length for fast work, city traffic and narrow country roads. Tire dimensions are 34 by 4 inches all around, making it possible to carry only one size and shift the worn rear tires to the front wheels. Brakes are of the band and internal expansion types, metal to metal. The cone clutch connects the motor with a three-speed sliding selective transmission, which is geared direct on high speed, at a ratio of two and one-half to one, or two to one if so desired. A propeller shaft is used to the bevel gear drive on the rear axle. The axles are large, and of the floating type. The cylinders in the motor, six in number, are cast separately, with a bore of 4½ inches and stroke of 5 inches, conservatively rated at 40 horsepower. Cooling is by water radiator. Jump spark ignition is supplied from storage and dry batteries. The weight of the car with tanks empty is 1,800 pounds. All cars are covered by a factory guaranty of 6 months from date of invoice. The Colt Runabout Co., Yonkers, N. Y., maker of this vehicle, has elected W. Mason Turner, recently associated with a New York motor concern, as its president and general manager. He has had a varied experience in motor work and is thoroughly conversant with every-

phase of its many problems. In the Colt six the problem of power and strength for moderate price must be looked upon as paramount, and the success obtained in this line is evident.

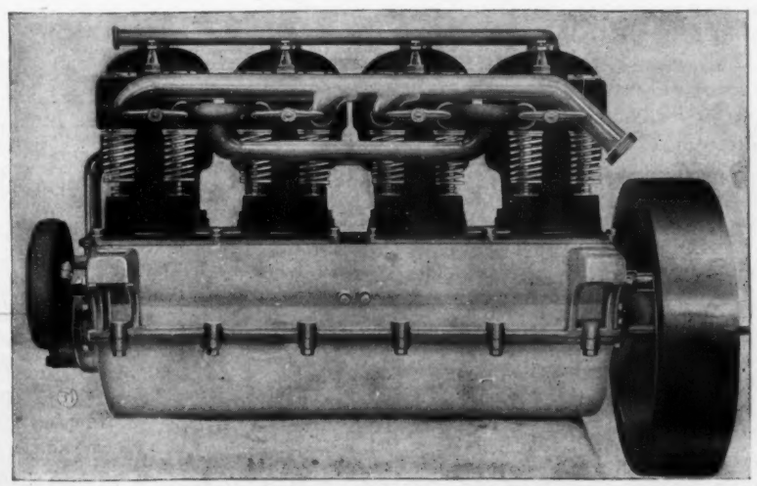
HALL'S NOVEL CARBURETER

Manufactured by the Charles E. Hall Co., 108 Broadway, Buffalo, N. Y., the Hall carbureter, of the accepted float-feed type, incorporates nearly all of the standard carbureter parts but combines an inter-connection among several that is wanting in many mixture furnishers. The construction of the Hall carbureter is illustrated in two views, both showing the carbureter cut vertically through its center, one with the line of cutting passing through the center of the float chamber and the center of the mixing chamber and the other with the cutting at right angles to this or briefly through the air passage and mixing chamber part. In the former illustration D marks the float chamber with its float P adjustable on its stem by which the inflow of gasoline is controllable by the ball end on the stem. On its passage from this float chamber to the spraying nozzle U the gasoline is regulated by a needle valve N located at the elbow in the passage between the float chamber and the nozzle. The nozzle U is located in the center of the mixing chamber A and in running condition the float level should be such that the gasoline will not overflow the tip of the nozzle. In this illustration the mixing chamber appears as a vertical tube or cylinder of good diameter and carrying two valves, a lower S not quite circular and equal in diameter to that of the mixing chamber and a circular valve F of the same diameter as the tubing A. The valve S is termed a starting valve being designed to be shut, closing the tube A when starting to insure plenty of gasoline being drawn out of the nozzle U. Immediately upon the motor being started this valve takes its wide-open position. The valve F is a common butterfly throttle for regulating the exit of the gaseous mixture to the motor. Now looking at the second illustration the air passage appears as a right-angled tubing, with a horizontal part at the left and a vertical part at right. The entrance B to the horizontal part marking the air entrance carries the starting valve S already referred to; in the vertical part is the throttle F shown entirely closing the passage A; and at the junction of the horizontal and vertical passages is an auxiliary air valve L held upon its seating by a light spring M surrounding its stem. The tension of the spring M



SECTION OF HALL CARBURETER

is adjustable through a nut K and lock nut Z. The valve L bears upon what is termed a strangling valve Q by means of which is determined the amount of normal air passage when the valve L remains seated. All of the entering air passes strangling valve Q on low motor speeds but with crankshaft acceleration the valve L is lifted from its seating by the call for more air from the motor cylinders. This opening of the valve L at such periods is looked to for furnishing a gaseous mixture filled with the exact proportion of gasoline vapor and air. The attachment for operating the throttle connects at F1 and the adjustment of this connection is through the nut F2 and its locking nut F3. The mixing chamber A is either exhaust or water jacketed the respective connections for these heating agents being at EE, and E designating the jacketed space surrounding the mixing chamber. If water is used it is drawn from the regular system used for cooling the motor walls. In adjusting the Hall carbureter the gasoline supply entering by connection Y is regulated so that the level in the nozzle U is $\frac{1}{16}$ inch below the nozzle top. At slow speeds the air valve L remains closed except the port controlled by the strangling valve Q. Having the gasoline level correct the needle valve N is given one turn. The air valve L is then adjusted to seat without pressure on its spring M. The throttle valve F is next partially opened and the motor started, holding valve S seated when starting. With the motor under way, open the throttle F, completely controlling the motor speed by the spark until it is regulated to the normal speed at which it should run. Next adjust the needle valve N for the correct mixture at the highest working speed. Follow this operation by adjusting the throttle lever screw F2 so that the throttle will always be held partially open and so keep the motor running at low speed. After this adjust the strangling valve Q to a position which gives a good mixture at low speeds under working conditions. If with these adjustments the motor does not respond quickly to the throttle adjust the automatic air valve L. Exterially the Hall carbureter is a small-sized, single-appearing device intended to fit easily to any motor design, whether vertical or horizontal in design.



REEVES' NEW MOTOR FOR RUNABOUT CARS

MOTOR CAR LITERATURE

The May issue of the Silent Partner, the house organ of the Globe Machine and Stamping Co., Cleveland, is as usual brimful of pithy paragraphs.

American motorists contemplating an Italian tour should not do so without securing from the Touring Club of Italy, located at Milan, Italy, a complete set of the maps of Italy issued by this club. Four of these covering the districts of Milan, Turin, Genoa and Venice are completed. These maps show distances, descents, curves, zig-zag crossings as well as indicating monuments and interesting landmarks. The maps are intended especially for motorists and cyclists who wish to see the country. Each map is enclosed in a pocket-size folder and is printed in colors adding to its value.

In its 170-page catalog the Franco-American Auto and Supply Co., Chicago, has decorated each page with a uniform border across the bottom carrying the firm name. On each side of the page is a pillar effect carrying the globe with the eastern hemisphere shown on the pillar at the left of the page and the western hemisphere on top of the right pillar. The illustrations on the pages are well arranged. In many cases description is limited but the size and price are given.

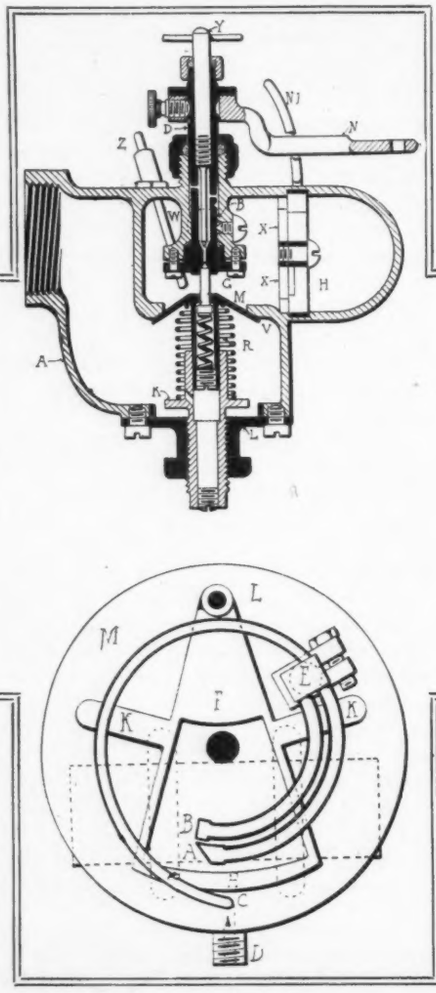
The Locomobile Co. of America, Bridgeport, Conn., encloses its instruction bookfor 1907 cars in a full morocco pouch, which action is deserving of special recognition, in that it maintains the book in first-class conditions throughout on entire season. This is important in that the book is a necessary one to every careful motorist.

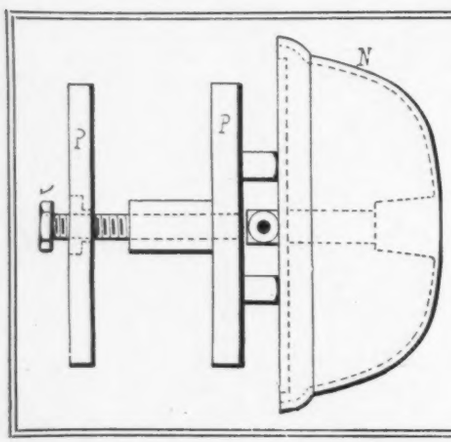
DEVELOPMENT BRIEFS

KEMP'S FLOATLESS CARBURETER

In his floatless Kemp carbureter, J. P. Kemp, 420 North Broadway, Baltimore, Md., incorporates two separate and distinct adjustments for the extreme speeds and loads of the motor and also a third, or mean, adjustment suitable for any condition of speed or load. The last mentioned adjustment is controlled by a single lever and will not change except by the act of the operator or accident. An analysis of this floatless carbureter reveals the main casing, A, having an integral valve seating, V, an engine connection and an air entrance by way of throttle, X. All air passing through the unrestricted passages of the device must go by way of the mushroom valve, M, which is termed a balanced valve in that a spring, R, tends to keep it seated, while a weaker spring, acts in the opposite direction, the resultant of these opposing forces being a spring subject to a mild force permitting of opening with easy action and closing positively. The plug guide, W, is a central body containing the gasoline throttle, D, which is controlled through a handle, N, so that a movement of the handle imparts a part revolution to the throttle, D, thus raising or lowering it, and as it is raised more space is left between its bottom and the pointed needle valve, G, allowing more gasoline to enter. The air throttle, X, is a circular plate filled with holes to correspond with openings in the seating, H, so that when the gasoline throttle is opened through the arm, N, the air throttle is partly rotated through the arm N1, which is a divided arm with one member on each side of the lever, N, making it impossible to move the lever, N, to the right or left without imparting rotation to the air throttle, X. When the motor is working each movement of the throttle control, on the steering wheel, accomplishes two results: first, opening the gasoline throttle; second, controlling the air supply. But there is another control, an automatic one, subject only to the demand of the motor. This reposes in the air valve, M, with its pointed stem, G, which shuts off the gasoline flow when the valve is seated as per illustration. When the motor is cranked the call for air, or, in other words, the minimum air pressure within the cylinders and the atmospheric air pressure in the carbureter above this valve, opens the valve, immediately permitting gasoline to flow. To increase motor speed more air is needed and more gasoline and to get both the arm, N, is moved, which, as previously stated, accomplishes this twofold result. The interconnection between the air and gasoline throttles can be so regulated to make any motor running conditions wished for.

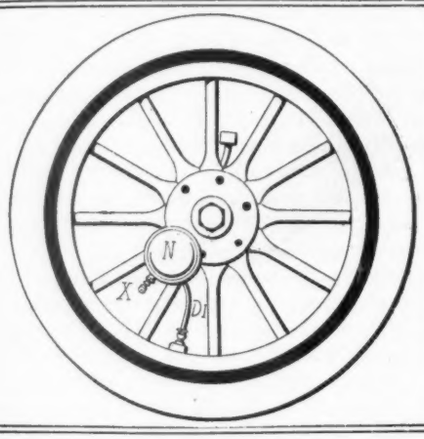
KEMP'S FLOATLESS CARBURETER





SIDE VIEW OF THE ALARM

SECTION OF TIRE ALARM

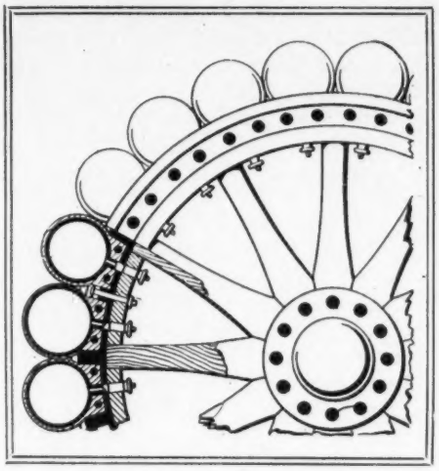


TIRE ALARM ATTACHED

AUTOMATIC TIRE ALARM

E. A. Terpening, Mokena, Ill., has perfected his automatic tire alarm, which is, in brief, a small gong or bell that he attaches to each wheel of a car and which gong starts ringing whenever the air pressure in the tire falls below a predetermined limit. Three illustrations show the device: That of the wheel shows the alarm, N, clamped between two spokes and its conduit, D1, for establishing a common air passage between the mechanism of the gong and the air tube of the tire. In this illustration X marks the valve for filling the tire through the gong, it being imperative with this device to kill the air valve in the tire. A second illustration shows a side view of the alarm in which N is the exterior of the gong, PP the pair of brackets for clamping to the wheel spokes and S the nut for holding the clamps in position. The third illustration is a section of the interior mechanism and which tells the story of how the alarm works. Air from the tire enters by way of nipple D into a semi-circular tubing, C, which conducts it into a cubical box, E, from which it passes to a pair of Bourdon tubes, A and B. When empty these tubes are curved, as illustrated, but when filled with air they start straightening in proportion to the air pressure within them. This straightening of these Bourdon tubes is the feature of the alarm. When tubes A and B straighten their free ends bear upon the steel arc H. This steel arc H is a part of a gravity striker, F, which is pivoted at its apex, L. On this striker are two hammer parts, K, adapted to strike the gong, N, which is removed in the illustration under question. If a tire is properly inflated the striker, F, is held rigid by the Bourdon tubes pressing upon the arc part, H, thereby preventing the arms, K, hitting the gong. Should the tire deflate and its air pressure fall, permitting the tubes A and B to take their curved position, then the striker, F, is free to oscillate on its pivot, L, and its arms, K, strike continually upon the gong, setting up a constant ding-dong, the same as produced in a hand bell.

CURRENT MOTOR CAR PATENTS

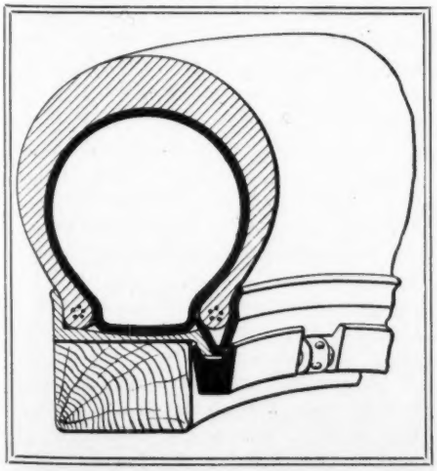


MAIN'S NOVEL TIRE

Spring in Tire—No. 855,468, dated June 4; to T. Midgley, Hartford, Conn.—Embedded at frequent intervals in the tread of the solid rubber tire are round metal studs which rest upon spiral springs encased in the rubber and extending to the tire base. These springs are for additional resilience other than that of the rubber.

Segmental Pneumatic Tire—No. 855,818, dated June 4; to W. R. Smith, Buffalo, N. Y.—This tire, instead of being one continuous rubber casing with a continuous inner air tube, is of the single tube style, but not a continuous single tube one, rather a series of segments equal in number to the spokes of the wheel. Each segment is a fraction, say one-tenth, of the entire tire and has its air chamber and valve. The total number of segments when positioned forms a continuous tire, which has as many separate air spaces and valves as it has segments.

Removable Tire Flange—No. 856,081, dated June 4; to T. Midgley, Hartford, Conn.—The wheel rim is formed with a permanent flange at one side and at the other has a short inturned flange formed towards the wheel hub. The removable flange on this side is a V piece with the outer arm elongated to embrace the tire lip. When this V flange is in position its short arm rests beside the inturned flange on the rim and is held thereto by a shallow V ring with turnbuckle which locks the V flange to the inturned flange.

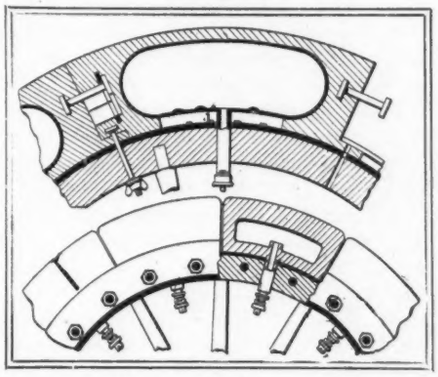


MIDGLEY'S REMOVABLE FLANGE

Many-Sphere Tire—No. 856,411, dated June 11; to C. P. Mains, Cincinnati, O.—In place of a continuous air tube within a continuous outer casing the patentee uses a series of spherical air chambers equal in diameter to the width of the tire. Each of these is contained in an outer casing that has lugs fitting in pockets in the rim. A separate valve is needed for each sphere. Side flanges assist in holding the several spheres in place. The size of the spheres is such as to admit two between spokes.

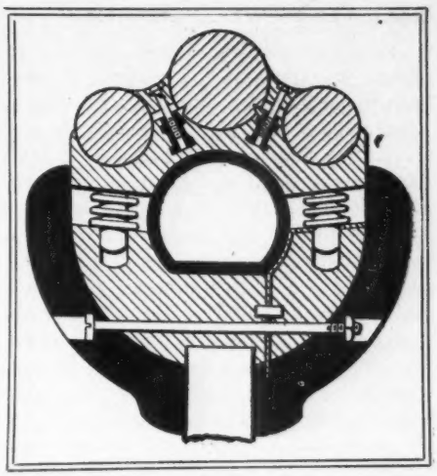
Tri-Solid Tire—No. 856,447, dated June 11; to D. G. Cook, Chippewa Falls, Wis.—The tread part is three small-diameter solid rubber tires, the larger-diameter one centrally located for the tread and two smaller-diameter tires one at each side of it. These three are embedded in a semi-circular tread part which rests upon an oppositely placed semi-circular piece reposing within the groove of the wheel rim. The upper semi-circular piece is attached to the under semi-circular piece through a series of studs at each side, these studs being rigid in the tread semi-circle, adapted to slide in and out of holes in the rim semi-circles, and having spiral springs for separating the two semi-circular parts.

HAMILTON'S CELLULAR TIRE



SMITH'S SEGMENTAL TIRE

Many-Celled Tire—No. 856,526, dated June 11; to T. F. Hamilton, Chicago, Ill.—The tire consists of a ring of segments of rubber having flattened egg-shaped air spaces within each, and a separate valve for each. The adjacent ends of the segments are secured to each other by a coupling spool which has an enlarged end in each segment, suitable recesses being formed for them. Where segments abutt they have a stepped union, and passing through both segment steps is a radial bolt which also passes through the wheel rim and carries a wing nut within the wheel rim.

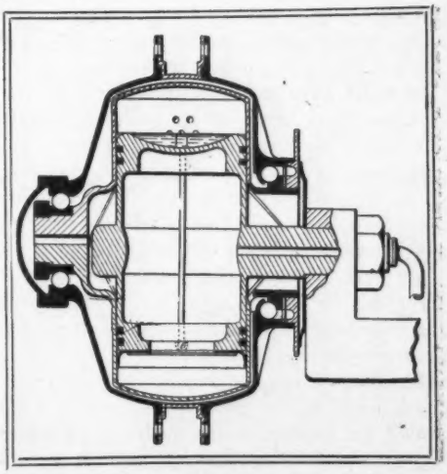


COOK'S COMBINATION TIRE

Spring Rim—No. 856,657, dated June 11; to C. F. Obrecht, Baltimore, Md.—The wheel has two concentric rims, the inner rim rigid on the end of the spokes and the outer rim spaced from it by a series of flattened and widened V-shaped springs which have the ends of the arms curved backwards. These springs bolt at their centers to the inner rim, one over each spoke, and at their curved ends bear upon the inner side of the outer rim.

Resilient Rim—No. 856,957, dated June 11; to A. R. Hubbard, London, England.—The wheel has two concentric rims with a wide intervening space filled with slightly-curved strap springs, which have eyeholes at the ends for bolt attachment to the outer and inner rims.

Pneumatic Hub—No. 856,510, dated June 11; to G. W. Bell, Liverpool, England—In the abnormally large wheel hub is a vertical cylinder in which reciprocates a piston attached to the end of the axle. A determined air pressure is maintained within the cylinder and suitable lubrication is provided.



BELL'S PNEUMATIC HUB

THE READERS' CLEARING HOUSE

BELIEVES IN SPEED CHANGES

New York—Editor Motor Age—As you desire the views of the readers of Motor Age regarding the opinions expressed in the articles by Mr. Lougheed, I have taken the liberty of writing you in reference to one point which seems to be of a somewhat debatable character. I refer to the possibility and even desirability of entirely eliminating the speed change and reversing gears from internal combustion engine-driven motor cars intended for practical use. In the first place the chances of their being eliminated, at least for some time to come, are shown to be very slight by the fact that the most successful type of steam automobile has a two-speed gear, notwithstanding the great flexibility of the steam engine. Moreover, most of the English steam trucks, as well as some foreign and American electric vehicles, are provided with speed change gears in order to enable them to cope with the severe conditions under which motor cars are often used. In fact, it would seem as though the great increase in the cost, weight and size of an internal combustion engine and the low efficiency at which such an engine would have to work under ordinary conditions would hardly be warranted by simply the elimination of the speed-change gear, especially when it is even thought desirable to use a gear on flexibly-powered steam and electric vehicles. The elimination of the speed change gear is not so much to be desired as is the elimination of certain types of gear—notably the sliding gear—and the improvement of the more rational forms. It should, of course, be possible and desirable to simplify the gear as the engine becomes more flexible by reducing the number of speeds to two on nearly all types of vehicles, and when this is done all gear troubles can practically be done away with, as planetary gears can then be used. This type of gear is, if properly designed and made, easily superior to any other type, but it has unfortunately not always been designed with the care or made in the manner in which other types of gears—the sliding gear, for instance—are made, with the result that it has been accused of possessing faults which it does not have when properly constructed. This form of gear also possesses the advantage that it can be made—in a patented form—so that it will give the reverse speed without the addition of a single part to those which are absolutely essential for obtaining the low and high speeds—the same parts being used for the reverse as are used for the other speeds. By this means the number of parts that are used in the gear is reduced to fully half the number in the ordinary planetary gear and it has only one set of gears—three altogether—one revolving brake drum, one brake band and set of band operating devices, thus cutting the cost of manufacture to nearly one-half that of the present planetary gears even though the present planetary gear is better than other types in this and other respects. Such a gear would be much more satisfactory than arranging an internal combustion engine to reverse, as suggested by Mr. Lougheed, even if it could be done with the same certainty and ease as with a steam engine, as no more parts are added to the gear other than those for the two forward speeds, and two speeds are believed to be necessary.—A. E. Osborn.

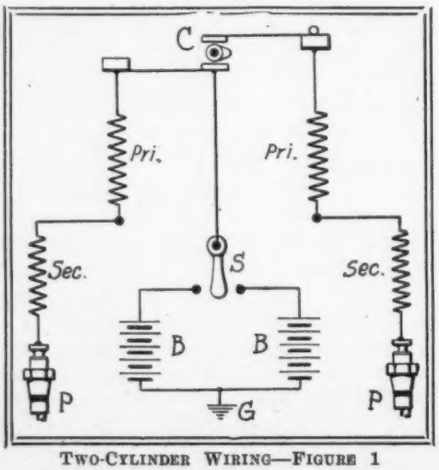
WIRING DIAGRAM WRONG

Athens, Ga.—Editor Motor Age—I enclose a rough diagram of batteries, spark coil, cylinders, spark plugs and commutator and would like to have you show me the most effective way to wire same. The coil is a Duplex, type E, for two-cylinder motor, and I desire to use six cells of battery at a time, arranged so as to switch on either set at will. Our local amateurs all differ as to the way of wiring and I thought it might be of interest to other inexperienced motorists like myself to see plain directions for this and similar cases from some authority.—Albin P. Dearing.

The sketch sent is entirely wrong and if a car is wired this way it is difficult to see how it runs, if it runs. Most coils have the terminals marked "bat," "com," "gro," for battery, commutator, ground, etc. If the coil is not so marked, consult the maker. The common system of wiring is shown in the diagram in figure 1.

REWINDING SMALL MOTORS

Ottumwa, Ia.—Editor Motor Age—I have a good-sized battery motor that runs on ten dry cells. It has No. 18 wire on the armature and No. 22 wire on the field. Can I rewind the field without changing the armature, so as to use it for a dynamo on my motor car? What size wire shall I put on it to obtain the highest possible voltage and what speed should this dynamo run before the governor releases? I want to light six lamps. What voltage can be procured from it if rewound?—L. A. M.



TWO-CYLINDER WIRING—FIGURE 1

The data given is hardly sufficient for a categorical answer to the questions, but, judging from the particulars given, the project seems entirely impractical for several reasons. Incandescent lamps, whether small or large, require a much steadier voltage than can be obtained with even the best governor on the dynamoshaft. If the voltage falls off even a little the lights will become very dim, and if it increases a little the life of the lamps is seriously shortened if they are not burned out. Any motor small enough to be run on ten dry cells will develop insufficient energy to light six lamps unless they are very small ones. If any rewinding is done, it will probably have to be more on the armature than on the field, and to do this properly requires skill. Few battery motors are built substantially enough or are protected sufficiently to adapt them to use as dynamos to be driven by friction on the flywheel of motor car engine.

PROPHESIED THE BUGGYABOUT

Miamisburg, O.—Editor Motor Age—Although the writer is in a position, owing to former association with George B. Selden, of Rochester, N. Y., to know more about the legal status of the claims of Mr. Selden than anyone outside of the A. L. A. M. except the attorneys, this is neither the time nor place for the writer to give his views. But it is believed that it is the time to call the attention of the public to the fact that Mr. Selden, away back in 1876 and 1877, saw, in his mind's eye, the advisability of using high wheels on self-propelled vehicles and had the good judgment to know that a sort of buggy type was certain to become popular in America. A reference to the drawings of Mr. Selden in his application for a patent, filed in the patent office in 1879, will prove the truth of this assertion. As the writer assisted materially in mounting Mr. Selden's three-cylinder engine, shown in his application, upon a buggy construction in 1905, and upon consulting Mr. Selden at that time about the diameter of the wheels he proposed using, it was ascertained that the front wheels were to be 36 inches in diameter and the rear wheels 40 inches. No one who is thoroughly acquainted with Mr. Selden and did not know him in 1877-78 has any idea how clearly he foresaw the needs of the public in a buggy construction away back years ago. To be sure he advocated, and still advocates, driving by the front wheels, and, as he states it, he prefers pulling a carriage to pushing it. His idea is that pushing the forward wheels

by the traction of the rear wheels upon the ground greatly resembles an endeavor to push on a rope. This is illustrated daily in the regulation type of motor car when the front wheels are turned at an angle to change the course of the car. They act as a sort of brake against the rear wheel traction and it tends to make the rear wheels skid. When the writer commenced designing the Hatfield buggyabout much consideration was given to driving by the front wheels, and in fact drawings were made for so driving, but in designing details quite a number of objections were met which almost precluded the possibility of front wheel driving on account of the axles and wheels, or wheels alone, in turning curves, turning at right angles relative to the body of the car upon which the motive power is placed. The writer does not wish to go into an extended article on this matter, but to place before the public the fact that George B. Selden was looking through the right colored spectacles in 1877-78 because he saw the visions which today pass in front of the eyes of the American people.—C. B. Hatfield.

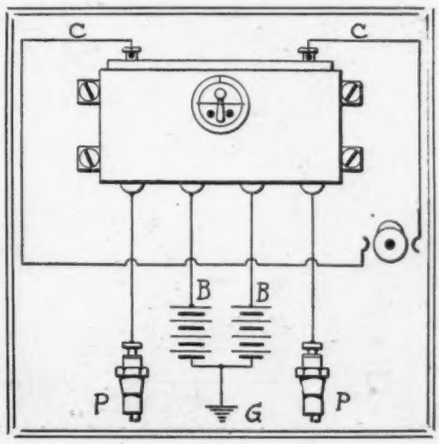
TWO-CYLINDER WIRING

Muskogee, I. T.—Editor Motor Age—Kindly give me a diagram of wiring for a two-cylinder vertical motor with Cadillac style of plugs, double Splitdorf dash coil with switch on the coil, in connection with two sets of dry batteries. I want to wire my machine properly. As I now have it wired when I throw off the switch the spark jumps from one point on the switch to the other and the motor keeps on running as though the switch were still on. I think there must be some fault in the wiring.—F. J. W.

There certainly is something wrong. It will be necessary to ground one of the electrodes of each plug and connect the cable from the coil to the other, as is given in the diagram in figure 2, which is redrawn from the Splitdorf wiring diagram sheet.

BACKS UP LOUGHEED

Chicago—Editor Motor Age.—I have read with great interest the first article by Victor Lougheed and wish to congratulate Motor Age and the author. I have been working along similar lines in regard to the engine problem, and consider this article by far the most accurate, clear, concise and convincing of anything of the kind I have ever read. I fully agree with the author on all the main points of the article, and, in fact, do not see how anyone who knows the subject can disagree with him on these points. However, there are one or two points which are not directly touched upon and on which I might say a word or two. The first is in regard to the time required for combustion. It has been shown in engineering tests on stationary engines that 25 to 30 per cent of the combustion occurs after ignition and prior to the point at which the exhaust begins, under the best mixture and other conditions, and under unfavorable mixture conditions this proportion becomes very much greater. In fact, it can be made almost anything desired, according to Clerk. As these tests were made on large slow-speed engines it is evident and, in fact, actually the case, that a large proportion of the power is lost in high-speed engines due to the late combustion of the mixture. This is most aggravatingly shown by the readiness with which the present motor car engine will back fire in the case of the two-cycle or fire into the carbureter in the case of the four-cycle, particularly on high speed or under unfavorable mixture conditions. You may remember that in the last Vanderbilt cup race a number of cars had their carbureters take fire and at least one car was put out of the race on this account. This point has also a great deal to do with mixture proportion and is important in any engine in which the power is developed by explosive combustion, and of course is of more importance in a two-cycle engine on account of back-firing. Without going into this point further I assume that this is in accord with Mr. Lougheed's ideas, as he speaks principally of rapid flame propagation and not rapid combustion, which is a different thing, but would like to hear if otherwise. Has Mr. Lougheed ever noticed the fact that the efficiency of a given four-cycle engine—or two-cycle, for that matter—decreases with the decrease in the load about in proportion to the proportion of burnt gas which remains to dilute the fresh explosive mixture, and does not this clearly show the possibility of holding the efficiency constant under decreasing load—in a given engine—providing only that all of the burnt gas is exhausted and the gas mixture proportion remains constant? Another point which may have only a theoretical bearing on the subject is in regard to the advantages derived from high compression. While it is true the combustion engine is primarily a heat engine, it is also true the internal combustion engine is a chemical engine—that is, an engine in which the chemical combination of certain elements produces the heat and possibly other things which become available as power. Now, while I do not know of any exact and positive evidence either one way or the other, it seems to me that a given volume of combustible mixture when combined and cooled to its original temperature will have a volume which is substantially greater than the uncombined mixture, at the same—or original—pressure. If this is true it will largely account for the low specific heat capacity of the combined mixture, partly for the increase of power due to increase of compression and partly for the extraordinary effect which a little burnt gas seems to have on the explosive value of the fresh combustible mixture and which does not seem to be fully accounted for even by Mr. Lougheed. Of course the last effect is the important one and can be avoided altogether, as I have done and as is done in scavenging and six-cycle engines, but the increase in efficiency and power due to the elimination of this objection can largely be estimated and accounted for if this conclusion is a fact and the various quantities are known. Can you say as to whether this conclusion is right or wrong, and why?—H. H. Wixon.



TWO-CYLINDER WIRING—FIGURE 2

AIR-COOLING TO WATER-COOLING

Oxford, Ind.—Editor Motor Age—Will you please tell me if it is possible to change an air-cooled motor into a water-cooled one and if the addition of a fan on an air-cooled Premier will give better results.—D. K.

It may not be impossible to change an air-cooled motor so as to have a water-cooled one, but it will be an experiment at best and will cost a good deal more than it is worth. Sell the motor and buy one to suit; there is no profit in experimenting. What model Premier does D. K. mean? There are two air-cooled Premiers.

DENIES BEARING TROUBLE

Philadelphia, Pa.—Editor Motor Age—In one of your issues, not very much prior to May 15, on page 12, you published an article headed "France Tests Solid Tires." In the second column, upper paragraph, last sentence, you stated that broken bearings were among the troubles encountered. As we noted that a number of cars fitted with these elastic tires were mounted on HB or DWF ball bearings, we were naturally interested and wrote to Paris to determine just what the bearing trouble was. In reply we have received a letter addressed to the French agents of the DWF bearings by the editor of l'Auto, Henry Lebeuf, dated June 7, in which he states that there is an error of some kind involved, since bearing troubles were not encountered. We should appreciate it were you to give this correction space in your valuable paper.—Hess-Bright Mfg. Co., by Henry Hess.

Among the Makers and Dealers

EXTERIOR OF THE NORTHERN MOTOR CAR CO.'S NEW PLANT AT PORT HURON, MICH.

Will Sell Electrics—The Autocar Sales Co. of New York has added Columbus electrics to its line of motor cars.

Will Have a Livery—An auto-luxe, a livery of high-class cars with liveried chauffeurs, is to be started in New York by the C. G. V. Import Co. on the lines of the establishment of Charron & Co. in Paris.

Takes More Territory—John S. Wiese, Long Island distributor for Michelin tires, has just concluded a contract with E. Lamberjack & Co., of New York, for additional territory, including Albany, Saratoga, Troy and Washington, D. C.

Northern's New Plant—The new plant of the Northern Motor Car Co. now is in operation at Port Huron, Mich. This plant is used for the production of Northern two-cylinder touring cars exclusively. It is under charge of W. H. H. Hutton, Jr., and is now turning out on an average of fourteen cars per week. The plant is complete in every respect and is furnished with modern equipment throughout.

After S. & M. Plant—Negotiations are in progress to secure the factory of the Simplex Automobile Co., of New York for Bridgeport, Conn. This concern has taken over the business of Smith & Mabley, who recently went into bankruptcy, and is reorganizing the old company. It is understood an option has been secured on the property of the Sherwood driving park. Should the deal go through a large plant, employing about 1,000 people, will be erected.

New Quaker Enterprise—A company has just been formed to take over the Mercedes car in Philadelphia. The new concern will be the West-Stillman Motor Car Co. Mr. Stillman, former manager of the Philadelphia branch of the Mercedes company, will be the manager of the new company, and E. P. West, a newcomer in the field, will be associated actively with Mr. Stillman. The Pennsylvania Auto-Motor Co., maker of the Pennsylvania car, is interested in this new proposition, and R. Harry Croninger, manager of the Pennsylvania company, will act as secretary and one of the directors of the new selling agency.

To Deliver 1908 Car July 15—The Tincher Motor Car Co., of South Bend, Ind., announces it has contracted to deliver to a Chicago purchaser a 1908 Tincher on July 15.

Colts Going Fast—William M. Turner, president and general manager of the Colt Runabout Co., whose factory is located at Yonkers, N. Y., reports unusual activity on the sale of the 40-horsepower Colt six-cylinder runabout. Mr. Turner said: "We started booking orders for the Colt Monday morning of last week and by Tuesday afternoon twenty-seven cars had been sold."

Hoosiers to Build—A deal has just been completed by which the Indianapolis Motor Car Co. has acquired a site in Indianapolis on New York street between Illinois street and Capitol avenue. Within a few days a contract will be let for a three-story concrete block building which will be used for manufacturing purposes and also as a garage. Later on the company will make motor cars, but at present it handles the Dragon in Indiana. It has temporary quarters on Kentucky avenue where the Boyd Automobile Co. was formerly located.

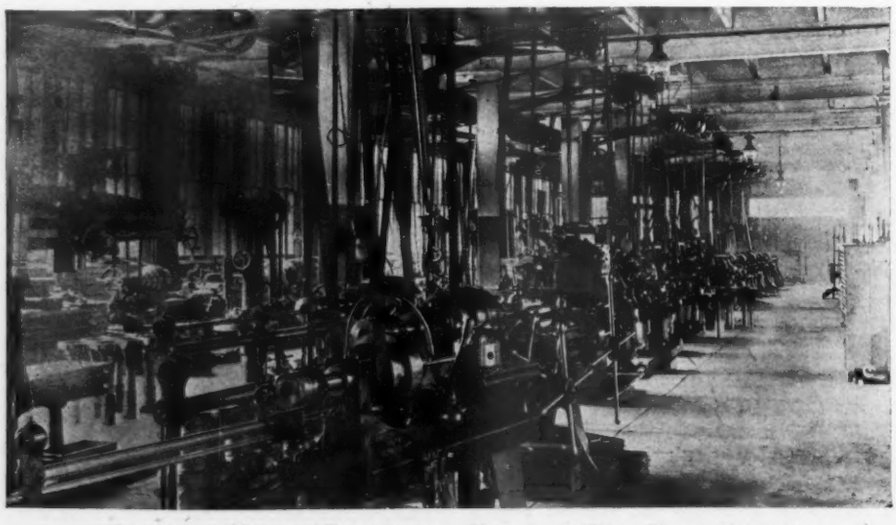
New Dragon Branch—The Dragon company has opened a Philadelphia retail branch at 143 South Broad street. A. B. Cumner has been appointed manager.

Swanbrough in Seattle—E. W. Swanbrough, for many years in the motor business in Denver, has become general manager of the Pacific Coast Automobile Co., Seattle, succeeding C. Z. Salling, who has resigned because of ill health.

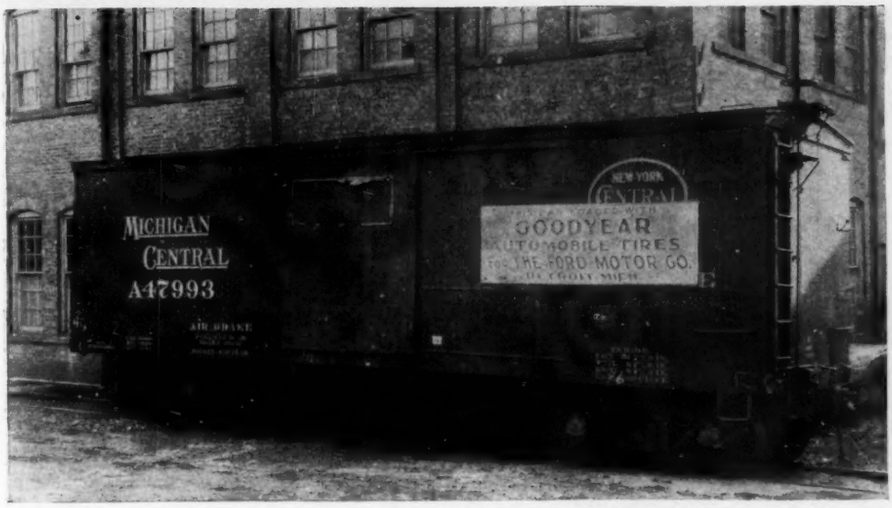
Will Handle De Luxe—The Bellefield Motor Co., of Pittsburg, Pa., has recently taken on the sale of the De Luxe cars. The Bellefield company is a new concern in the business and has a seven-story garage building adjacent to the Schenley hotel and Duquesne gardens.

Goodyear Agency Named—The Goodyear Tire and Rubber Co. has opened an agency at 1404 Ridge avenue, Philadelphia, just off the upper end of gasoline row, with L. S. Hall in charge. A steam vulcanizing plant for the quick repair of tires, which is rapidly nearing completion, will be one of the many conveniences of the new agency. Harry G. Fitler will continue as special factory representative of the Goodyear in the Quaker City and the adjacent territory.

Rushed With Work—The E. J. Thompson Co. is reported to be rushed with work at its plant at 5917 Penn avenue, Pittsburg. So many heavy cars have been handled recently that the company has taken out its old elevator and installed a heavy freight lift. It also has recently installed two new power sewing machines, which are used exclusively in the manufacture of custom-built cape tops. A large gasoline storage tank has been built underground in order to reduce the hazard occasioned by cars entering and leaving the shop. The rush of orders has forced the company to devote 3 nights each week, with eight trimmers, to the cape top department. It is rumored that this concern will



ONE OF THE MACHINE ROOMS IN THE NORTHERN'S PORT HURON FACTORY



CARLOAD OF GOODYEAR TIRES SENT TO FORD MOTOR CO.

shortly get another location in the east end, where a building will be erected for accessory work.

Handling the Deere-Clarke—The Zim-Rock Motor Car Co., of New York, will act as sales and general distributing agent of the Deere-Clarke Motor Car Co., of Moline, Ill.

Geneva Has a Plant—The Motor and Manufacturing Works Co., of Geneva, N. Y., has been organized and is ready to begin work with fifteen hands. The directors are David Reid, Murray G. Hoskins, Ernest Bowen, T. H. Chen and E. J. Cook. Mr. Reid is president and Murray G. Hoskins secretary and treasurer.

Tire Change in Cleveland—J. P. Kavanaugh, who for some time has been manager of the Cleveland branch of the Hartford Rubber Works Co., has resigned. He was for a number of years on the road for this company. P. H. Goodall, who for a number of years has been traveling the Ohio territory for the Hartford company, has been appointed local manager of the Cleveland branch. This change will take effect July 1.

Franklin Continues to Spread—The H. H. Franklin Mfg. Co. has broken ground for a five-story building in South Geddes street, where 300 additional men will be employed in making motor cars, bringing the total number of employes of the company up to 2,000. The building will be 60 by 100 feet in dimensions and will have 30,000 square feet of floor space. It is a continuation of the Geddes street building from its north end to West Marcellus street, and this will make the total length of the factory on Geddes street 346 feet. The addition will cost in the neighborhood of $500,000, will be fireproof, reinforced concrete, with offices on the first floor and basement, the other floors to be used for factory purposes. It is to be completed in 90 days. The additional factory space will give the company opportunity to increase its output of commercial cars. During the coming season 200 1-ton trucks will be manufactured and the company is also preparing to put on the market a light delivery vehicle and a 4-ton truck.

Shock Absorbers for Sixes—Sixty sets of Truffault-Hartford shock absorbers have been ordered for the six-cylinder Stoddard-Dayton. Seventeen other companies have adopted this shock-absorbing device as regular equipment, it is announced.

Electrics for Porto Rico—A contract has been made by George K. Wheeler, sales manager of the Columbus Buggy Co., for the exclusive sale of Columbus electrics in Porto Rico. Robert Graham, of Ponce City, a pioneer on this island, has taken the agency. The company is to ship immediately three carloads of its stanhope and surrey types to Ponce.

Breeze Branching Out—The Breeze Carbureter Co. of Newark, N. J., has recently been organized to take over the business of the Breeze Motor Mfg. Co., of the same city. President Breeze has interested new capital, and with more commodious quarters and a large amount of newest machines installed he intends increasing the output. Walter Christie chose the Breeze carbureter for his racing car, which is entered for the grand prix. The Breeze Carbureter Co. is moving from 28 Maine street to 276 Halsted street, Newark, N. J., and will be located soon.

Streit Will Move—The A. Streit Machine Co., of Cincinnati, O., will remove to its new plant, Marquis street, near Colerain avenue, July 1.

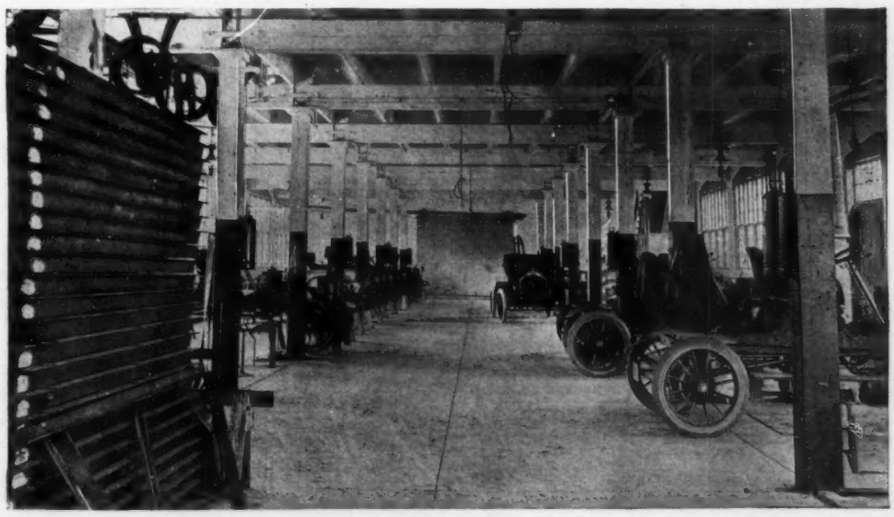
Booming Great Smith—J. F. Billings, sales manager of the Smith Auto Co., Topeka, Kan., is making an extended tour through the coast states in the interests of the Great Smith car.

Journalist Turns Manager—William M. Magraw has succeeded J. K. Mears as general manager of the Philadelphia branch of the Autocar Co. Mr. Magraw is a Philadelphia newspaper man and a prominent member of the Quaker City Motor Club.

Needs More Room—The Campbell-Corwin Co., which has the Brooklyn and Long Island agency for the De Luxe and Queen, has found its temporary quarters at 522 Vanderbilt avenue, inadequate for its business, and has taken a larger building at 371 Flatbush avenue. The company's garage on Union street is progressing rapidly, and will soon be ready for occupancy.

More Room for Witherbee—The increased demand for Witherbee storage batteries through the middle west and Canada has necessitated the enlargement of the Detroit branch factory. A four-story building at 220 Jefferson avenue is being rapidly fitted out with all the necessary appurtenances. C. E. Brelsford, the new manager, is now in charge at the Detroit factory.

Keenan a Speedwell Man—Walter Keenan, formerly general manager of the Standard Oil Co. interests in Dayton, O., has assumed the general management of the Speedwell Motor Car Co., Dayton, O. The Speedwell company is composed of P. G. Schenck, president of the Dayton Malleable Iron Co.; M. Sternberger, Jackson, O., president of the Superior Coal Co., and a number of other rich men.



CHASSIS ROOM IN THE NORTHERN FACTORY AT PORT HURON, MICH.

The Realm of the Commercial Car

STODDARD-DAYTON TAXIMETER CAB FOR TOWN AND CITY USE

A NEW chapter has opened in the realm of the taximeter cab in America. Its origin is with the Dayton Motor Car Co., Dayton, O. This concern not only announces its intention of manufacturing this style of cab but has had its first cab completed for several weeks. Following a few of the dictates of fashion coming from Paris, London and Berlin the Stoddard-Dayton taximeter cab is a two or three-passenger landaulet style of vehicle made with an 18-horsepower motor, composed of four cylinders cast in pairs with cylinders having 3⅞-inch bore and 3¾-inch stroke. The motor is housed under a small, neat bonnet which, combined with the small lines of the cab body gives a well-proportioned vehicle. The motor design in all respects follows those lines used in the model H Stoddard-Dayton runabout. It has opposite mechanically-operated valves, and ignition is from a storage cell, with unit coil on the dash and concealed wiring.

Lubrication is by a Kinwood oiler, mixture comes from a float feed carbureter, with an auxiliary air valve, the gasoline supply being carried in a 14-gallon tank. The cooling capacity of the radiator and cylinder jackets accommodates 4 gallons of water. The flywheel clutch is a leather-faced cone member, with a ball-bearing spring thrust as well as clutch thrust. Changes in speed are made through a selective sliding gearset providing three forward variations and a single reverse. All transmission shafts are carried on adjustable Timken roller bearings. The final transmission of power is through a propellershaft enclosed in a tubing, which tubing is supported at its forward end through supports from a crosspiece of the car frame. Assisting this tubing is a torsion rod paralleling it. Radius rods couple from the center part of the side pieces of the frame with the rear axle housing. The rear axle, a Stoddard-Dayton design, is a floating construction with the car weight taken on Timken rollers and the divided driveshafts driving through clutch ends with the wheel hub. Braking is through a band member in the rear of the transmission and emergency brakes carried on the rear wheels. Noted in the running gear of this taximeter cab are: Wheelbase measuring 101 inches, a pressed steel framework manufactured in the Stoddard-Dayton factory, 2-inch semi-elliptic springs, 36 and 46 inches long, respectively, in front and rear; 30-inch wheels shod with 4-inch Goodrich quick-detachable tires, and 9-inch clearance. The cab is finished in colors to suit the whims of the buyer and is equipped with gas lamps, side lamps, tail lamps, horn, generator and top made from cloth to pantasote.

FRENCH TRIALS END

Twelve out of the forty-one commercial vehicles which started in the 20-day test on the roads around Paris completed the ordeal with perfect scores. The three taximeter cabs using alcohol as a fuel successfully completed the circuit also. Although twelve may seem a small fraction of forty-one, yet when the trials and severity of the test are considered it must be admitted the showing was excellent. Readers must not forget that throughout the run the cars had to make 90 to 120 miles for 20 consecutive days, and that their crankcases, gearboxes and other parts were sealed, prohibiting getting at any of the machinery within them. Throughout the 20 days the cars carried full loads over the rough streets in the suburbs of Paris and the better roads of the adjacent country.

The results of the consumption tests leave no doubt as to the value of the competition as a means of eliminating all unsound cars, or cars in which weakness is developed in one or other of the vital parts and for presenting at the end of the competition cars which are capable of such a test as the consumption trial ending the affair and which go through hardships which if anything are more rigorous than those which would attend the actual commercial service affected to the cars in regular service. Moreover, the consumption test—indeed the whole trials—was carried out under the stern eye of the military authorities and there is no doubt that the figures given on the consumption and weights of the cars are strictly in accordance with facts. The value of these figures is enhanced by reason of the widely different classes of industrial vehicles undergoing the trials and also in view of the very variable weights and loads, and finally in view of the three distinct classes of fuel used by the competitors. Perhaps the table of comparative results made up from these tests gives as good an indication of the possibilities and capabilities of the commercial lorry as it would be possible to get at the present time, while the fact remains that none of the cars has been built specially for the competition. They all are regular productions of the best French makers and will be delivered to their respective customers in due time, as have been others of the same stock. This, from the customer's point of view, coupled with the fact that the cars have indicated their cost of upkeep in the endurance test of twenty long daily stages in any weather and conditions of roads, and finally their actual fuel expenditure in the consumption test, is a convincing argument for the immediate adoption of the motor wagon to replace horse teams.

PANHARD-LEVASSOR TRUCK IN FRENCH CAR TRIALS

PARKING CARS OVER NIGHT DURING FRENCH TRIALS

There are several well-defined lessons to be learned from these trials. Perhaps the most striking is that which concerns the type of vehicle emerging victorious from the severity of the regulations. It is the Darracq-Serpollet car which is here referred to. This car represents the best mechanical and engineering experience of the Darracq concern together with the genius of the Serpollet creation. Together they have turned out a series of buses and heavy vehicles which tend to become a dangerous rival to the explosion motor vehicle. Another reason for this dangerous competition lies in the fact that the steam cars burn crude petroleum, which is and will always remain cheaper than the gasoline fuel, which latter tends to increase daily in price. In the table given below the total consumptions show that the steam cars consumed nearly twice as much petroleum as did the explosion motors gasoline fuel, but this discrepancy is more than equalized by the fact that gasoline is about twice as expensive in commerce as is petroleum, whilst even for the purposes of the trials the price of petroleum was fixed by the authorities at 54 per cent of the price of gasoline. In this trial the fuel was sold by the authorities and the prices fixed in advance, so there is no possibility of getting around the striking figures shown in the table herewith. As regards alcohol, the price in commerce may now be slightly in excess of the price of gasoline, but the price has a tendency to decrease, whilst that of gasoline is constantly on the increase. Thus the Brillé six-wheeled omnibus and the three runabouts which consumed alcohol throughout the tests have something in their favor. The results afford definite basis of comparison as regards the quantities of gasoline and alcohol required in the same service and the price of the latter has but to diminish a little and that of gasoline to increase a little to see the excess cost of running with alcohol fuel entirely disappear. It is beginning to be fully recognized in France that the days of gasoline are limited and makers are turning their attention more and more to alcohol as a solution of the problem. It is predicted that within the next 3 years a great decrease in the price of denatured alcohol will take place.

The price of fuel had thus been fixed before the start of these trials by the authorities, who, moreover, as above stated, supplied the fuel to those needing it and any other form of fuel was forbidden to the competitors. The prices charged were as follows: Gasoline, $2.40 for 10 gallons; denatured alcohol, $2.40 for 10 gallons; Roumanian petroleum, $1.30 for 10 gallons. The actual results follow:

	Total weight	Load	Consumption, Gals.
Second class, vehicles transporting between 1,000 and 4,400 pounds:			
1—Desmarais and Morane, Delahaye..	6,800	3,100	8.76
2—Aries	3,800	1,200	6
Third class, vehicles transporting between 4,400 and 6,600 pounds:			
1—Darracq - Serpollet, steam	13,070	6,150	16.3
2—Darracq - Serpollet, steam	13,110	6,150	15.8
3—Turgan	12,830	6,400	10.0
4—Panhard-Levassor .	12,470	5,300	9.5
Fourth class, vehicles carying over 6,600 pounds:			
1—De Dion-Bouton...	13,480	6,750	10.3
2—Darracq - Serpollet, steam	16,050	7,800	21.5
3—Darracq - Serpollet, steam	16,190	7,800	21.7
4—Mors	15,710	6,780	11.6
Fifth class, ombibuses carrying at least ten persons:			
1—Aries	5,750	1,800	8.76
2—Brillie, burning alcohol, six wheels.	10,880	3,400	13.3
Light touring cars:			
1—De Dion-Bouton, alcohol	2,600	.....	4.34
2—De Dion-Bouton, alcohol	2,400	.....	4.31
3—Vinot Deguingant, alcohol	3,000	.....	7.3

COMBINATION HOSE WAGON

The efficiency of the Hartford fire department has been further augmented by the addition of a Knox motor-driven combination chemical and hose wagon. The Hartford department is a pioneer in the use of self-propelled fire apparatus and has done much to substantiate the merits of this type of apparatus. The new vehicle supersedes an old single horse-drawn hose reel which had a habit of falling to pieces while on the way to a fire. The motor of the car is of 20-horsepower with opposed cylinders located under the body of the machine. The rear half of the floor space is utilized for the storage of 1,000 feet of 2½-inch steamer hose and the forward section is given over to two 25-gallon chemical tanks. Above the tanks is a wire cage, or basket, which contains the chemical hose. The wheels are 34 inches in diameter, the front ones being fitted with 4-inch solid Turner tires and the rear tires are of the Midgley tread type. Drive is from the countershaft by side chains. For night driving a Rushmore headlight fed by a Prest-o-lite gas tank illuminates the way. There are two oil side lights and two oil fire lanterns are carried above the body over the rear step. The chemical tanks are brought into play by means of a crank located in the left side panel. This crank works a bevel gear device. Two ladders are carried, a single ladder and a combination extension affair. Crowbars, axes, hand-extinguishers and similar essentials are conveniently distributed about the vehicle where they may be had at a moment's notice. The speed of the car is about 20 miles an hour with a crew of five men and loaded tanks. Hartford has a good many fires in the course of a year but luckily most of them are trivial. Local fire fighters are agreed that it is expedient to reach a fire as soon as possible and that as little water as possible should be used. The wagon has accommodation beside the driver for one man, and space for four on the rear step.

KNOX MOTOR-CHEMICAL WAGON IN HARTFORD

FROM THE FOUR WINDS

Booming Alcohol—In France a league is being formed for the development of the use of alcohol in explosion motors.

Concession to Motoring—For the first time motor cars were admitted into the enclosure in the Bois de Boulogne, where the fete des fleurs was held on June 8.

Atlantic City Plans—Preparations for the Atlantic City motor carnival week are progressing rapidly. Many of the 155 spaces in the 150 by 250 feet exhibition hall have been taken already. The races during the first half of the week will bring together all the fastest foreign and American cars.

Gymhkana in Rochester—Members of the Automobile Club of Buffalo have been invited to attend a day of gymhkana sports to be given in Rochester on June 29 under the auspices of the Rochester Automobile Club. The contest will be open to all members of cars in Rochester and vicinity, regardless of membership in the local club.

Reo Shines Abroad—One of the most strenuous reliability tryouts ever run in Denmark was the one promoted by the Copenhagen Automobile Club May 26. The distance was 300 kilometers over the hilliest roads in the vicinity of Copenhagen. Among the few star performers that finished with perfect scores was a two-cylinder Reo touring car, which covered the route in the shortest time permitted by the rules.

Buffalo Chief Converted—That the motor car is gradually driving the horse out of business has been evidenced in Buffalo, where Fire Chief McConnell, who has followed for many years the custom of being driven to fires behind a fast stepper, has fallen into line with other prominent chiefs and has decided to use a car in going to the scene of a blaze. In testing a car the chief recently covered the 4⅘ miles in 4 minutes. The test was so successful Chief McConnell thinks the result fully justifies the use of a machine rather than a horse.

On a Tire Trip—A combined demonstration and test tour is taking place in the interest of the Fisk tire under the direction of F. A. Drake, New York manager of the Fisk Rubber Co. Mr. Drake has had a Locomobile touring car equipped with the Fisk heavy car type tire and the new removable rim. The car was sent by boat to Albany; from that city it is being driven to Buffalo by way of Troy, Schenectady, Binghamton, Elmira, Syracuse, Utica and Rochester. In each city stops will be made for the purpose of interviewing the various motorists interested in the Fisk product. On arrival in Buffalo the car will be turned over to J. C. Zimmerman, a Chicago representative of the Fisk Rubber Co., who will drive it to Cleveland preparatory to its entry in the A. A. A. tour.

Call Them Cornpoppers—The Thomas Flyer testers at Buffalo have just originated a new term for the motor cycle cops who blossom each year with the spring and whose principal duty is to keep overenthusiastic motor car users from doing things they shouldn't. They call them cornpoppers, a name peculiarly descriptive.

Ruling on Drawback—The treasury department has made a ruling to the effect that the regulations of January 31, 1905, providing for the allowance of drawback on the exportation of motor cars manufactured by the Locomobile Co. of America, of Bridgeport, Conn., with the use of imported rubber tires to which valves of domestic manufacture are fitted, shall be extended to cover the exportation of cars manufactured by the Pope Mfg. Co., of Hartford, Conn., with the use of imported tires, in accordance with its sworn statement of May 3, 1907, filed with the collector of customs at New York.

Ride for the Blind—The annual run from Boston to Sharon with the pupils of the Perkins institution for the blind, which is given annually by the Boston Automobile Dealers' Association, was held last week. This run is on a par with orphans' outings in other cities. Chester I. Campbell had charge of the trip and there were twenty-five cars in the run. More than 100 of the youngsters were taken out to the summer camp, where they had a delightful day and were provided with a fine lunch and brought back again in the evening. The children enjoyed it immensely. They manifested a great interest in the cars and clambered about the machines feeling of the various levers and horn bulbs.

California Roads—California is rapidly coming to the front in developing the good roads system. Frank Lindsey, who has been demonstrating the Pope-Toledo cars, relates some of his experiences while on this trip through California. He says: "I endured more hardships the year and a half I was out there than all the rest of my life. There are very few roads out of San Francisco; in fact, they are not roads, but mere passages. While the roads leading into Los Angeles are fair, they are far from being excellent. Our severest test was while touring the southern part of California through sand and over mountains. At times we were compelled to use flat-bottom boats, the rain having washed away the roads entirely. California has adopted the convict system of road building so successfully employed by other states. While touring through southern California we saw convicts at work on the improvement of roads with their camps every few miles. The convicts work in gangs of twenty each, with an armed guard to each gang."

Going on Glidden—Harry Knights, treasurer of the Bay State A. A. and one of the members of the A. A. A. racing board, is to go on the Glidden tour with Archie Hughes in a Pierce runabout.

Celebrities Take a Ride—Roy Faye, Boston representative of the Matheson, had a trio of distinguished people in his car last Saturday for a trip to the revolutionary battlefields. They were Colonel William F. Cody, General Nelson A. Miles and John Shepard, the horseman.

Rochester's Orphans' Day—The plan of Buffalo and other motorists to give the orphans an outing will be followed in Rochester on August 6, when the motor car owners in the flower city will take the youngsters to Ontario beach. There will be about 200 cars in line.

Duke Likes to Motor—The duke of Abruzzi, the famous Italian explorer, who has been spending a week in Boston, has passed more of his time in motor cars than in anything else. He was the guest of Mr. and Mrs. Larz Anderson several days and as they have one machine for every day in the week the duke had plenty of riding about.

Winton's Horseless Handicap—For the first time in the history of horse racing a manufacturer of motor cars has encouraged the development of the horse by offering a purse or stake for a horse racing event. When Charles B. Shanks, general sales manager for the house of Winton, was in Denver a few weeks ago, he completed arrangements whereby Alexander Winton hung up a purse of $400 to be known as the Winton horseless handicap, a race that will be run by thoroughbreds on getaway day at Overland race track, which will be July 13.

Unique Contest—The Wildwood run to be held on July 3 and 4 by the Motor Club of Wildwood, N. J., is creating interest in the vicinity of Philadelphia. The run will be through Clayton, Vineland, Milleville, Tuckahoe, Rio Grande and other picturesque places and is to be what is known as a regularity run. Upon their arrival at Wildwood, which will be early in the evening of July 3, the contestants will place their cars on the board walk for inspection by the public. The winners of the run will have their cups presented and these will be on exhibition during the evening. A Fourth of July celebration in the morning will consist of a parade along the boardwalk for about 5 miles. In the afternoon races will be held on the magnificent boulevard, Central avenue, which is 2 miles

long and remarkably smooth. Several Dragons have been entered for all of these events.

To Tour in Electric—F. A. Babcock, Jr., secretary and sales manager of the Babcock Electric Carriage Co., of Buffalo, is to make a long-distance tour of Pennsylvania, Ohio, Indiana and Michigan in a Babcock electric runabout.

Car Runs True—Manager V. A. Charles, who handles the Rambler in Boston, made a 500-mile run from Boston to the mountains in 2 days last week during which he claims he never had to touch a thing on the car except handle the wheel and levers.

Buffalo Deal Falls Through—The Automobile Club of Buffalo has been unable to make successful negotiations for the purchase of the old Larkin homestead in Lockport, N. Y. If the house had been bought it would have been used as a clubhouse. The members are now trying to secure the Cottage hotel on the Chestnut road, 4 miles east of Lockport.

Must Sound Horns—Buffalo motorists have been requested by the vigilance committee of the Automobile Club of Buffalo to sound their horns on approaching crossings. The importance of the law, which gives to vehicles on streets running north and south the right of way over those passing on cross treets, also has been pointed out by the committee. The members of the vigilance committee have been sworn in as special police officers and have the authority to arrest violators of the speed laws. So far they have made no arrests.

Buffalo's Old Home Week—Motorists from all parts of the country will visit Buffalo early in September to attend the Old Home week celebration. The motor day committee has been appointed as follows: Seymour P. White, chairman; Dai H. Lewis, Clarence Clifton, E. R. Thomas, J. B. Eccleston, William H. Hotchkiss, Thomas M. Gibson, Gus G. Buse, P. B. McNaughton, R. K. Albright, Frank B. Hower, F. A. Babcock, Albert Poppenberg, Dr. Charles Van Bergen, Ralph G. Wright, C. B. Penney, Ralph Plumb and Percy Pierce. A mammoth motor car parade, with prizes for the best decorated cars, will be a feature. There are upward of 3,000 cars in Buffalo, so that the parade promises to be a big event.

Fine Showing for Buses—The number of passengers carried by the four motor bus lines in Berlin during the month of April last amounted to 1,829,651.

Vigilants Working—Success already has crowned the efforts of the vigilance committee of the Automobile Club of Buffalo. This committee is doing all it can to suppress reckless driving and is receiving and acting upon complaints of citizens against reckless motorists.

Denver Entertains Orphans—The Colorado Automobile Club celebrated Orphans' day on June 22. Eighty cars were placed at the disposal of the committee and 500 orphans and waifs from five institutions were driven over the city, supplied with ice cream and cake at City park, which feat was accompanied by a band concert, and by 6 o'clock all the guests of the club were at home again.

Quaker City's 24 Entries—Not fewer than a dozen of the best foreign and American cars will line up for the 24-hour event which is scheduled to start at 5 p. m. next Saturday. Among the sure starters are two Frayer-Millers, two Hayneses, two Loziers, two Dragons, an American Mercedes, a Darracq, a Mitchell and a Pennsylvania; besides which there are four more possibilities which may materialize before entries close. One of the Dragon entries will in all likelihood be the best of that company's three Vanderbilt cup entrants.

Scorching Microbes Numerous—Atlantic City authorities, at their wits' end as to the best means of overcoming the scorching evil, have decided to form a motor cycle squad of half a dozen coppers to patrol Pacific and Atlantic avenues and the boulevard leading into the city. There is some talk of similarly equipping a force of motor police by the counties through which run the main routes leading to the city-by-the-sea. The level roads and the salt ozone seem somehow to set the speed microbe a-going and many an otherwise sedate driver, when he sniffs the first faint whiffs of the saline-impregnated atmosphere, mechanically lets out a few links and before he knows it he is a candidate for the county jail.

High Gear-Sealed Bonnet Test—A. E. Morrison, Boston agent for the Oldsmobile, whose cars won both events at Readville May 30, is planning to make a sealed bonnet test on the high gear with one of the Oldsmobiles from Boston to New York and return in a few days.

Milwaukee Plans Run—The newly formed Milwaukee Automobile Trade Association will hold its first reliability run Saturday over a 195-mile course, running from Milwaukee to Oconomowoc, Watertown and Madison, back to Milwaukee. Al Reeke has been elected president of the trade association.

Wants One More Home—In addition to its Lake Mahopac and Long Beach clubhouses, the City and Country Motor Club is now making arrangements for a new country home near New York city. Several places in the vicinity of the metropolis are being considered, the idea of a new house being to provide a rendezvous for the club members who wish to make short evening trips after business hours. While Lake Mahopac and the Long Island resort make delightful Sunday and holiday tours, the plan of a suburban home where motorists can dine in pleasant surroundings is bound to meet with approval.

An All-Mitchell Meet—The Mitchell Motor Car Co. recently promoted a novel affair—a hill-climb and endurance run for Mitchells, which was styled the first annual California Mitchell jubilee and which was held in the beautiful Santa Clara valley. The climb was up Alum Rock Cañon park hill, near San Jose, 1¼ miles long and with a 15 per cent grade. E. P. Lion, of San Jose, won in the touring car class in 2 minutes 45 seconds, and Dr. Rigdon, of San Francisco, in the runabout division in 2 minutes 44 seconds. Thirty-five cars took part in the run to Del Monte the next day, carrying 130 people. Dinner was had at the Del Monte Club and the return was made to San Jose on the third day. Secretary G. V. Rogers, of the Mitchell company, originated the idea.

MITCHELL MOTOR CAR CO.'S FIRST ANNUAL OUTING AT DEL MONTE, CAL., IN WHICH THIRTY-FIVE CARS TOOK PART

LEGAL LIGHTS AND SIDE LIGHTS

NEGLIGENCE OF PEDESTRIANS

In a recent court decision the negligence of a person alighting from a street car and being struck by a motor car was discussed. The plaintiff, a woman, alighted from a street car, and after taking two or three steps was struck and injured by the defendant's motor car. Her testimony was that after she stepped off she looked along the street in front of the car, and seeing no vehicles approaching started to cross diagonally to the curb at the crossing, which was a short distance behind the car, when the motor car caught her dress and pulled her down backward and ran against her. The machine had just crossed in front of the car from the opposite side of the street, which was obstructed, and came behind the plaintiff. The defendant contended that the woman started to cross the track behind the car, and, meeting another motor car which was following the street car, she stepped backward in front of the machine which struck her. The speed of the motor vehicle was in dispute. Under these facts the United States circuit court for New York, southern division, held that such issues of fact required the submission of the case to the jury; that accepting the defendant's contention as correct, the plaintiff was not necessarily chargeable with contributory negligence, and, even if so, it would not prevent her recovery if the driver of the defendant's machine saw or should have seen her dangerous position between the two machines in time to stop his own before striking her. The case holds that a passenger alighting from a surface street car is not bound, as matter of law, to look in both directions along the street before starting to cross the space between the car and the curb, but the question whether the failure to so look constituted negligence is one of fact to be determined by the jury under all the conditions and circumstances shown by the evidence.

STARTS A QUIZ

Former District Attorney Marshall B. Clarke has been conducting, as chairman of the courts committee of the City Club of New York, an inquiry into the failure of city magistrates when sitting in the Bronx to properly punish persons for overspeeding motor cars. He has examined patrolmen and officers of police, and records of courts, where any were kept. On his report the City Club's courts committee resolved to continue the collection and collation of facts concerning cases of violation of the motor vehicle law, and the disposition of them by magistrates, and to present instances and evidence to the board of city magistrates. Mr. Clarke's investigation shows that, in the cases looked into, all arrests for overspeeding were made after a stop-watch had been held upon machines running over previously measured courses; that the defendant in many instances was not sworn; that the policeman was often not permitted to give evidence; that minutes seldom were kept of testimony, and that the defendant was usually given the benefit of the doubt.

LIABILITY OF CITY

In an action brought against a city to recover for the death of plaintiff's intestate, it was shown that while the deceased was operating a motor car in one of the streets of such city, and while turning from one of the street car tracks laid on such street to another, he ran into a fence erected at the side of the latter track for the purpose of guarding the excavation which had been made in the street for the purpose of building an underground railroad. It was alleged that the accident was due to the presence in the pavement between the tracks of a hole not exceeding 6 inches in depth into which the wheels of the motor car slipped, causing it to lurch against the fence. It also appeared that the surface railway had laid its tracks under statutory authority and that the underground road was being laid under like authority, and that the city had no control over either of them, and there was evidence to show also that no hole existed in the street prior to the time when the work for the underground road was commenced. It was held by the New York court of appeals that under such circumstances, assuming that the accident was due to the hole in the pavement, the existence of such hole did not render the city chargeable with negligence nor make it liable for the result of the accident.

SEATTLE REGULATES TRAFFIC

The use of motor cars on the streets of Seattle is regulated in an ordinance adopted at a recent meeting of the council. The measure is a general codification of all measures passed, and which have a general bearing on the motor car. No new features were added to the measure, the purpose being to collect under one head all legislation. In fact this is but part of a general codification plan. What might be considered a new feature is laying emphasis on a section which prohibits stands on First, Second and Third avenues from Pike street to Yesler Way. This is the present heart of the business district. The cross streets are not included. An old law prohibited stands on these streets.

DEFECTS IN STREETS

The passing of a motor car driven with ordinary care and reasonable speed and the fright and shying of a gentle horse thereat constitute events in the proper use of a public highway or street calling for its maintenance in a safe condition, and an injury done to a traveler by ite unsafe condition, in connection with such an event, is one of those dangers to which travelers are exposed by defects in the highway and for which indemnity is provided when the danger ripens into actual damage. A person is not precluded from recovering from a municipality for injuries from a defect in a highway, dangerous to travelers in ordinary vehicles, on the ground that when injured he was traveling in a motor car. In a Massachusetts case a rope was stretched across the street from a stake at the side of a sewer trench in the middle of the street to a telegraph pole in the sidewalk as plaintiff was approaching in a motor car. In attempting to pass to the right of the trench he was struck by the rope, which could not be seen until he was within 2 or 3 feet of it. The driver was proceeding slowly and there was nothing to warn him of the presence of the rope. In an action against the city it was held that the evidence was sufficient to sustain a verdict against the city.

DEFINES STORAGE

Under a lien law giving a lien for reasonable charges for work and materials furnished in making repairs to personal property at the request or with the consent of the owner, the right of lien is dependent upon the continued possession of the property by the one claiming the lien, and, in the absence of express statutory provision a garage keeper has no lien for the amount due for repairs to and supplies furnished for a motor car which the owner, during the time it was kept at the garage, had and exercised the right to use at his pleasure, nor has such garage keeper a warehouse lien on the motor car for housing it, as it was not "stored" within the meaning of the lien law.

CASE FOR THE JURY

A boy about 12 years of age was playing in the roadway of a street, throwing a ball and running to catch it. The defendant's car, driven by himself, was coming along the street at full speed in the middle of the street, giving no warning by horn, bell, whistle or other sound, and when it approached the boy dodged and the car hit him. The boy was knocked down and injured. The court held that the question of contributory negligence was properly submitted to the jury.

BRIEF BUSINESS ANNOUNCEMENTS

Cincinnati, O.—The Auto Livery and Repair Co. has taken the agency for the Aerocar.

Ontario, Can.—The Canadian Construction Co. is erecting a garage on West A street.

Fort Smith, Ark.—A new garage is being erected on North Twelfth street for F. Boehmer.

Danville, Ill.—Coffing Brothers have been granted the contract for the erection of a new garage.

Philadelphia, Pa.—A new brick garage is to be built for Herbert MacKellar at 2099 North Sixty-third street.

Camden, N. J.—The F. C. Carver Co. has been incorporated with a capital stock of $50,000 and will deal in motor products.

New York—A. C. Keene, who has been connected with the White Co., is now attached to the sales department of the Ford company.

New York—The schedule in the bankruptcy case of Smith & Mabley has been filed, showing assets of $680,902, and liabilities of $206,188, of which latter about $90,000 are suits for personal injuries.

Pittsburg, Pa.—Thomas Hoey, who has been connected with the Standard and the Banker Brothers companies, has gone into the tire repair business and has a store and office in the garage of the State Auto Co.

Springfield, Ill.—The De Luxe Motor Sales Co. has been incorporated with a capital stock of $50,000 and will deal in motor cars and accessories. The incorporators are S. Folsom and Dwight Lawrence.

Richmond, Va.—B. A. Blenner has purchased the new garage of Jenkins Brothers at 1607 Broad street and will remove there at once. He will continue to operate his old establishment in addition to the new quarters.

New York—Dudley S. Phinney has allied himself with C. A. Duerr & Co., the agents for the Royal Tourist. Mr. Phinney is the proprietor of the Cayrego lake hotel and the Hotel Shellerake and has also been the agent for the Plant system of hotels in Florida.

Indianapolis, Ind.—A new motor company is being organized here, with temporary quarters at 114-119 Kentucky avenue. A. W. J. Markham is the president of the company, R. A. Radle vice-president and general manager, Paul Smith secretary and treasurer. Mr. Radle was formerly connected with the Sheffield Car Co., and will have entire charge of the business of the concern. The company is to act as Indianapolis agent for the Dragon car, and also for the Logan commercial truck. Later on a light delivery wagon will be manufactured by the company.

Philadelphia, Pa.—A. G. Powell has opened a new garage at 1404 Ridge avenue, where he will act as the agent for the new Chalfant touring car.

Providence, R. I.—The Auto Tire and Supply Co. has opened a store at 134 Washington street, and will supply all makes of tires and other accessories.

Akron, O.—The Ruede Auto Garage Co. has been incorporated with a capital stock of $10,000. The incorporators are E. F. Ruede, H. E. Loomis and Forrest Firestone.

Pittsburg, Pa.—The Standard Automobile Co., the agent for the Packard and Franklin cars, has opened a downtown store in the new Century building on Seventh street.

Allentown, Pa.—A charter has been filed for the Bethlehem Auto Co. with a capital stock of $100,000. The new company will engage in the manufacture of motor vehicles, cars, boats, locomotives and hardware specialties of all kinds.

Cleveland, O.—The Park Drop Forge Co. has been incorporated with a capital stock of $100,000 by G. H. Kelly, M. G. McAleeman, J. C. Rexroth and George Cockford. The new company is being organized in connection with the White Co., and will manufacture drop forgings for that concern. During the summer a plant will be built, and work started in earnest in the fall.

Dover, Del.—The American Travel Club has been incorporated with a capital stock of $100,000 and will conduct touring parties by railroad, steamer and motor cars.

Pittsburg, Pa.—The Pittsburg Auto Repair Co. has removed to Baum and Whitfield streets, where it will have an establishment for tires and all other accessories.

New York—The Eureka Automobile Station has been incorporated with a capital stock of $10,000. J. E. Murphy, W. B. Coughlan and J. W. Robertson are the incorporators.

Philadelphia, Pa.—Application has been made for a charter for a new corporation to be known as Burwell & Co., who will engage in the manufacture and sale of carriage and motor supplies.

Springfield, Ill.—The Duplex Motor Car Co. has been incorporated with a capital stock of $30,000, and will manufacture motor cars. The incorporators are K. Gulbranson and C. M. Hanson.

Port Huron, Mich.—The National Spring and Wire Co. has decided to establish a branch plant at St. Catherines, Ont. The company is engaged in the manufacture of motor car and buggy springs.

Columbus, Ga.—The Columbus Motor Car Co. has been incorporated with a capital stock of $1,000 and the privilege of increasing it to an amount not exceeding $25,000. The new concern will deal in motor cars, bicycles and supplies and accessories.

Battle Creek, Mich.—The Kneeland Mfg. Co., of Lansing, has been consolidated with the Anderson Foundry and Machine Co., of this city, and will take possession of the plant of the latter concern. The new company will engage in the manufacture of marine and gas engines.

Trenton, N. J.—John L. Brock, of Prior & Brock, has leased the land in the rear of the Tremont house, on East State street, and will erect a two-story brick garage 80 by 200 feet. Possession of the ground will be obtained in August and Mr. Brock expects to be able to open his garage by September.

Columbus, O.—The Buckeye Motor Car Co., which was recently incorporated with a capital stock of $25,000, has elected the following officers: President, B. G. Jones; vice-president, L. F. Sater; secretary, J. A. McDowell. Mr. Jones was also elected treasurer. The company will occupy the plant of the North Side garage, in the rear of 494 North High stret.

RECENT INCORPORATIONS

Seattle, Wash.—The Keystone Auto and Machine Co., capital stock $12,000. Incorporators, C. C. Waltz, J. T. Geiser and S. H. Cormer.

Hot Springs, N. Y.—Knickerbocker Garage, capital stock $60,000. Incorporators H. V. and A. P. Palmer, of Brooklyn, and C. A. Singer, of Larchmount.

Phoenicia, N. Y.—Kent Spark Plug Co., capital stock $12,000. Incorporators, W. W. Pickard and T. A. Clements.

Augusta, Me.—Pacific Traction Co., capital stock $3,000,000; to manufacture motor cars and appliances. Incorporators, J. Berry, who is the president and treasurer of the company, and L. A. Burleigh, both of Augusta.

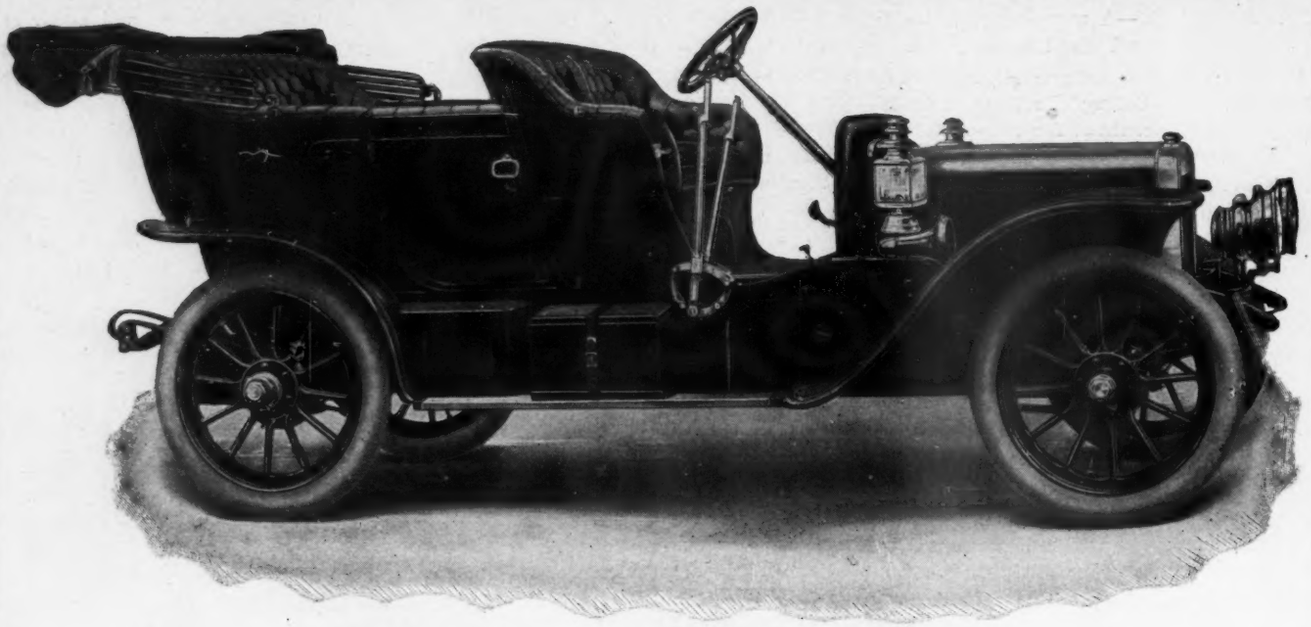
Boston, Mass.—Napier Motor Co. of America, capital stock $200,000; to manufacture motors, engines, etc. Incorporators, O. P. Cole, of Boston, who is named as the president and treasurer of the concern, and H. W. Ogden, of Brookline.

Jefferson City, Mo.—Arrow Motor Vehicle Co., capital stock $2,500; to manufacture and deal in motor vehicles and do a general machine shop business. Incorporators, August and H. O. Ross.

Indianapolis, Ind.—Heitger Carburetor Co., capital stock $10,000. Incorporators, W. E. Clark, J. A. Heitger and G. H. Heitger.

Lansing, Mich.—Colonial Motor Co., capital stock $20,000.

WINTON



Three Perfect Scores

The Winton Model M made Perfect Scores in the New Jersey Automobile Club's three-day Endurance Test; The Long Island Automobile Club's Endurance Test (original run); The Long Island Automobile Club's Endurance Test (run over; only perfect score cars allowed to compete).

The report on the New Jersey Test is as follows:

"Model M Winton, C. S. Calvert, the nominated driver, made a perfect score. This car had run more than 4000 miles prior to contest, and was used for demonstrating purposes up to the last minute before start of contest. No expense involved in preparing car for test. Car stopped only at controls. Engine was cranked but twice in three days—once at start of test, and once at noon-control. After standing all night, engine started on the spark."

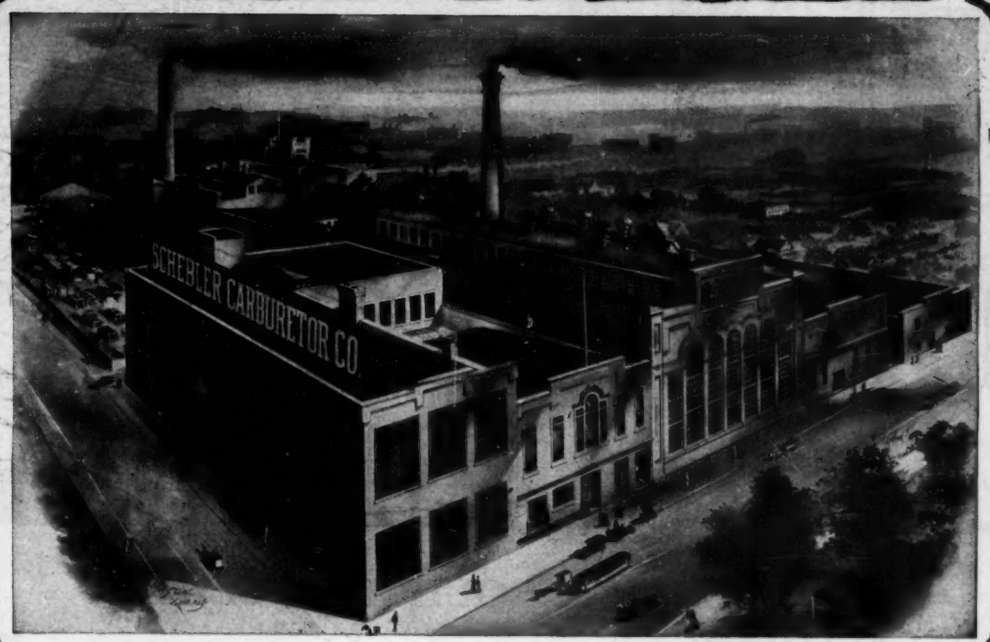
That's real endurance and reliability—the kind that keeps down repair bills and makes motoring enjoyable for the man who purchases a car.

40 H. P. MODEL M, $3500.
30 H. P. TYPE X-I-V, $2500.

In Runabout bodies at the same prices. Limousines $1000 higher. Write for details of Landaulets and Physician's Coupes.

THE WINTON MOTOR CARRIAGE CO.
Member A. L. A. M.
CLEVELAND, OHIO, U. S. A.

We conduct our own Branch Houses in Chicago, New York, Boston, Philadelphia, Pittsburg, Detroit, Seattle and London.



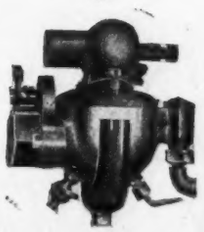
Here we can readily care for the carburetor business of the entire world.
All orders shipped same day received. Can you beat it?

As a living demonstration of the fact that Sturdy Oaks from Little Acorns DO grow let us submit to your observation

The SCHEBLER CARBURETOR

In 1904 we sold 500 of 'em. Last year, 40,000. This year the capacity of our mammoth plant is equal to 20,000 per month.

WHY THIS GROWTH?



STANDARD OF THE WORLD

"The Heart of the Automobile"

WHEELER & SCHEBLER MANUFACTURERS

LIST OF AGENTS

EXCELSIOR SUPPLY CO., Chicago, Ill., Exclusive Agents for Chicago and Cook County, Ill.
E. J. Edmond, 75 W. 44th St., New York.
Pope Manufacturing Co., Hartford, Conn.
Chas. E. Miller, 824 Main St., Buffalo, N. Y.
Chas. E. Miller, 406 Erie St., Cleveland, Ohio.
Chas. E. Miller, 227½ Jefferson Ave., Detroit, Mich.
E. B. Belcher, 20 Green St., Malden, Mass.
Hub Automobile Exchange, Dorchester, Mass.
National Electrical Supply Co., Washington, D. C.
J. W. Lathrop & Co., Mystic, Conn.

G. D. Thorndike, State of Maine Agent, Portland, Me.
Jos. Brassard, Central Falls, R. I.
Wallace Bros., Norfolk, Va.
The Autolight Motor & Supply Co., 508 N. Broad St., Philadelphia, Pa.
Page Engineering Co., Baltimore, Md.
Smith Elec. Engineering Co., Watertown, N. Y.

LOCATION OF NEW PLANT

Shelby and Sanders Sts. and Barth Ave.

INDIANAPOLIS, IND.

Neustadt Auto & Supply Co., St. Louis, Mo.
Kansas City Motor Car Co., Kansas City, Mo.
C. J. Smith & Co., 354 St. Peters St., St. Paul, Minn.
The Angier Co., Boston, Mass.
The E. R. Cumbe, 1528 Court Place, Denver, Colo.
F. C. Bowlus, 332 Baronne St., New Orleans, La.
Chanslor & Lyon Motor Supply Co., 930 S. Main St., Los Angeles, Cal.
Chanslor & Lyon Motor Supply Co., 503 Golden Gate Ave., San Francisco, Cal.
Wilson & Co., Ottawa, Ont., Canada.
McCulloch & Boswell, Winnipeg, Manitoba.
Canada Cycle Motor Co., Toronto Junction, Canada.
Schuman Carriage Co., Honolulu, T. H.
Geo. Neill & Co., 38 Fenchurch St., London, England.

Threads and Gear "one-piece," positively no "give" to either

Threads and Gear "one-piece," positively no "give" to either

The MIDGLEY Universal Rim

Is the REGULAR EQUIPMENT of the

AUTOCAR COMPANY
BARTHOLOMEW COMPANY
BAY STATE AUTO COMPANY
CADILLAC MOTOR CAR CO.
(Third year)
COLUMBUS BUGGY COMPANY
CAMERON CAR COMPANY
(Second year)
ELMORE MANUFACTURING CO.
MITCHELL MOTOR CAR CO.
(Second year)
NORTHERN MOTOR CAR CO.
(Third year)

Other Large Users

T. B. JEFFERY CO.—(50 per cent of their '07 product)
POPE MANUFACTURING COMPANY REO MOTOR CAR COMPANY

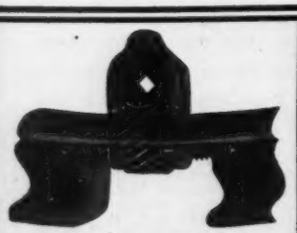
MORGAN & WRIGHT, THE HARTFORD RUBBER WORKS COMPANY,
G & J TIRE CO.
Recommend and use exclusively

MIDGLEY UNIVERSAL RIMS

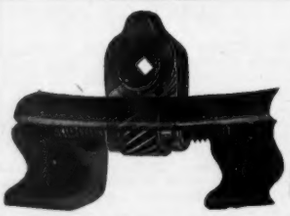
SOLE MANUFACTURERS

The Midgley Mfg. Company

COLUMBUS, OHIO



Threads and Gear "one-piece," positively no "give" to either



Threads and Gear "one piece," positively no "give" to either

The New Rambler

MODEL 245.

NO matter how elaborate the design or expensive the construction, no BETTER or more SERVICEABLE car can be built than this, the latest of the Rambler line.

¶ Motor, 35-40 horsepower, sliding gear transmission, shaft drive, wheel base 112", wheels 34", with 4" tires.

¶ Equipment includes full cape top, five lamps, storage battery, horn, pump, tools and tire kit.

¶ The price is $2,500 and we earnestly invite comparison with any car at any price.

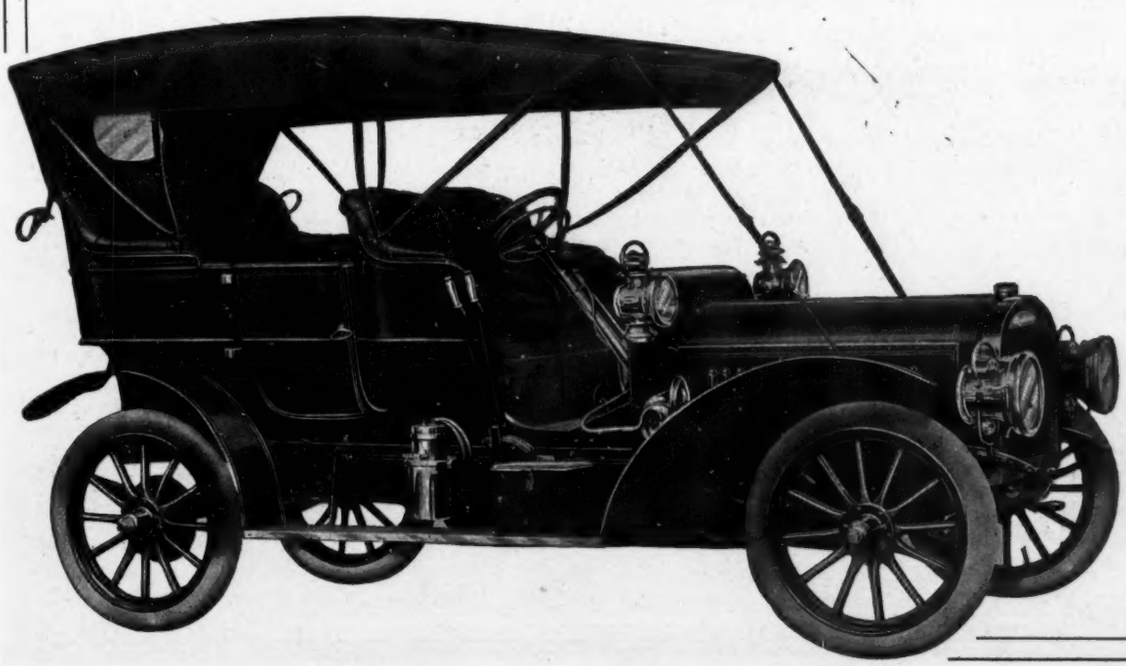
Thomas B. Jeffery & Company

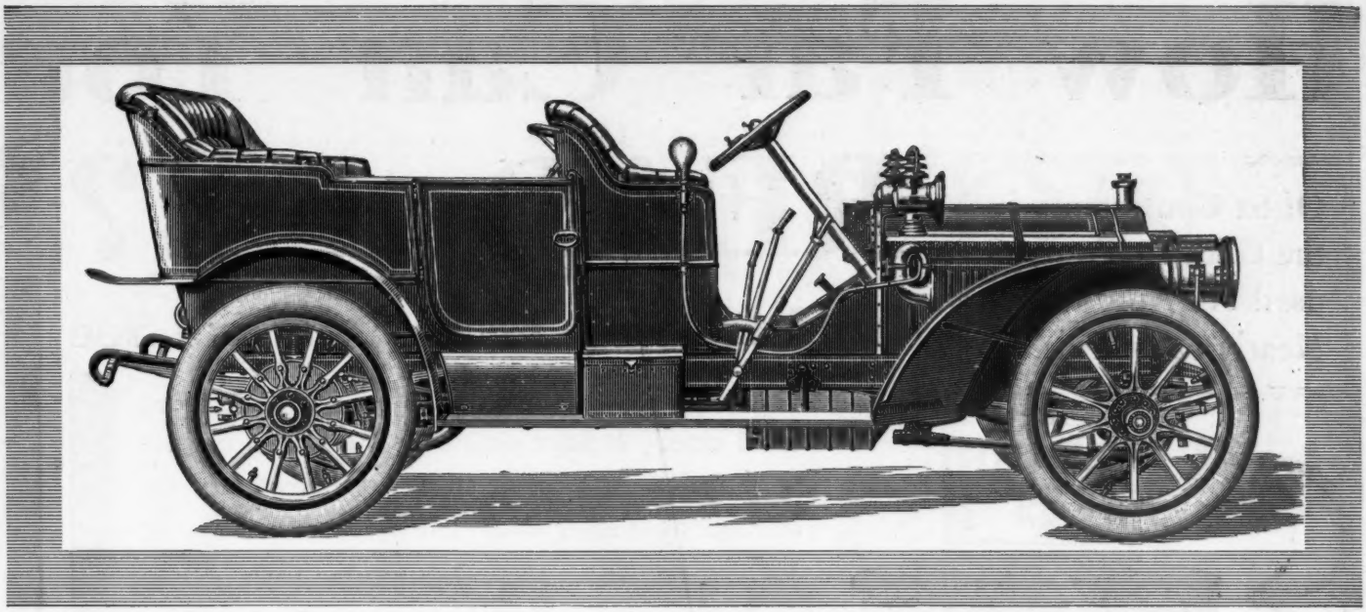
Main Office and Factory: KENOSHA, WISCONSIN

BRANCHES

CHICAGO MILWAUKEE BOSTON PHILADELPHIA SAN FRANCISCO

New York Agency, 38-40 W. 62d St. **Representatives in all leading cities**





Packard "THIRTY" 1908

FOR the season of 1908, the Packard Motor Car Company continues its time-tried policy of devoting its great factory to the production of motor cars of one model—a new Packard "Thirty." In its most notable form this is a touring car, and also is furnished as a runabout, limousine and landaulet, or equipped with cape cart or Victoria top. Capable, modish in design and luxurious in appointment, the car is a Packard throughout, with improved detail and refined construction. The price of the touring car, in standard finish and equipment, is $4,200, f. o. b. Detroit.

Packard Motor Car Company

Detroit, Michigan

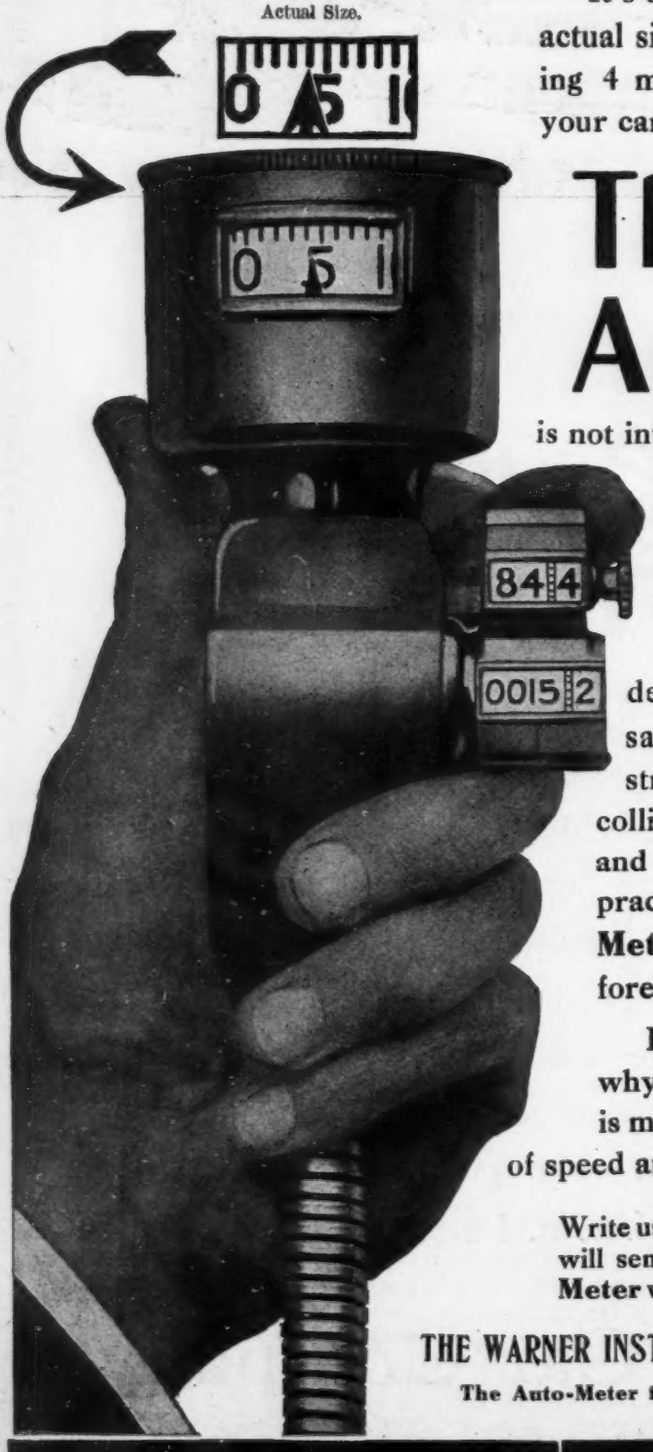
When Writing to Advertisers, Please Mention Motor Age.

How Far Can You READ this?

Of 62 Contestants in the Glidden Tour, 38 used The Auto-Meter Nearly two-thirds.

Hold it Away From You and See

Actual Size.



It's the scale of **The Warner Auto-Meter,** actual size. It says your Automobile is traveling 4 miles an hour. It is just as steady on your car as it is in your hand—for the scale of

The Warner Auto-Meter

is not influenced by the jar of the car—speed alone moves it. It doesn't bob around, the way other indicators do, until you are not certain whether it says 5 miles or 15.

Let us tell you more about this wonderful instrument—how it's made with sapphire jewels like a watch, yet is so strongly built that it takes an axe or a bad collision to break it or render it inaccurate, and how we use *magnetism* (in the only practical way) which makes **The Auto-Meter** as reliable as a mariner's compass forever.

Let us **prove** to you the good reasons why our **Guarantee** of **The Auto-Meter** is more liberal than any other manufacturer of speed and distance indicators **dares** to make.

Write us **the model or power** of your car and we will send you full information about **The Auto-Meter** with price ready to install on the dashboard.

THE WARNER INSTRUMENT CO., 663 Roosevelt St., Beloit, Wis.

The Auto-Meter is sold by all Dealers and at the best Garages.

ATTENTION

All Entrants in The Chicago Motor Clubs

RELIABILITY CONTEST

¶ We want each contestant in the Chicago Motor Club's Second Annual Reliability Test, this Friday, June 28, to have his car equipped with a

Stewart Speedometer

¶ Therefore, to serve our customers thoroughly and well, we will have enough experts on hand at our factory (within ten minutes' drive of the starting point — Grant Monument) Thursday night and Friday morning at 5 o'clock, to care for all cars which may be driven there for Speedometer attention.

¶ The fact that the committee in charge of Friday's big event selected the Stewart Speedometer from among all others, as

THE OFFICIAL INSTRUMENT

for most accurately measuring the 175 mile route, determining time allowance for miles between controls, etc. would seem to prove every claim we have made for accuracy, truth-telling dependability and never-failing steadiness. It ought also influence the uninitiated intending purchaser in his choice of makes.

¶ But if you would have your car equipped for Friday's Great Reliability Test,—Quick Action is imperative!

¶ Stewart Speedometers come in four styles as follows:—

No. 3 50-Mile $40.00 No. 4 60-Mile. $60.00 No. 5 90-Mile, $75.00 No. 6, 120-Mile, $100.00

Stewart & Clark Manufacturing Co.

510 DIVERSEY BOULEVARD, CHICAGO, ILL., U. S. A.

Remember our factory is less than ten minutes' drive from Grant Monument, the starting point, and our men will be at the plant ready to equip your car as early as 5 o'clock Friday Morning. Stop on your way to the starting place and have your Speedometer requirements attended to. It won't take 30 minutes to make you happy for life.

The "HALL" CARBURETER

Powerful Dependable Economical

ALL **SIZES**

A critically tested and proven carbureter. Used exclusively for over a year and now being used by one of the largest manufacturers making 1,200 high-grade automobiles per annum.

CHARLES E. HALL COMPANY

Manufacturers

BUFFALO, N. Y. 108 Broadway U. S. A.

☞ **We also manufacture a COMPLETE LINE of AUTO and BI. WRENCHES.**
Particulars upon Application

ADDRESS ALL COMMUNICATIONS TO THE COMPANY.

Ford Motor Company,

AUTOMOBILE MANUFACTURERS.

WORKS & OFFICE.
COR. PIQUETTE & BEAUBIEN STS.

ADDRESS REPLY TO
MANUFACTURING DEPARTMENT

HENRY FORD, PRESIDENT.
JOHN F. DODGE, VICE PRES'T
JAMES COUZENS, SECY. & TREAS

Detroit, Michigan, June 24, 1907.

Holley Bros.,

Detroit, Mich.

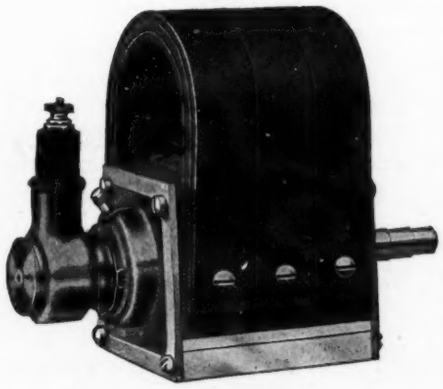
Gentlemen:

Our Ford, six-cylinder car, which won the 24 hour race Saturday, breaking all world's records, was equipped with the Holley Magneto. We consider that it aided us materially, as it required no attention during the entire contest.

Yours truly,

FORD MOTOR COMPANY.

Henry Ford
President.



The above letter is self-explanatory. The Ford Car which won the 24-hour race in Detroit, Saturday, June 22d, was equipped with a Holley Magneto. During the entire race the magneto was in constant use. The battery was never used and the magneto was not repaired or adjusted in any manner whatever. A severe test like this in public proves conclusively that the Holley Magneto is not equaled by any ignition device in the world. Several of the contesting Cars were equipped with foreign made magnetos.

HOLLEY BROTHERS CO. Detroit, Michigan

Stewart Speedometer

Our Five Year Absolute Guarantee

$40

WE guarantee each Stewart Speedometer against everything but misuse for a period of five years from date of purchase. This guarantee and warrant covers materials, mechanical construction and accurate operation of the instrument, flexible shaft and all connections. Each instrument is calibrated, tested and sealed before leaving the factory. Any instrument returned to us, at our factory, charges prepaid, with seal unbroken, that has failed to give proper service, or failed to register accurately, or which has otherwise proved defective in material or construction, within above mentioned term, will be repaired or replaced free of charge.

We can make immediate shipments on 50 and 60 mile instruments

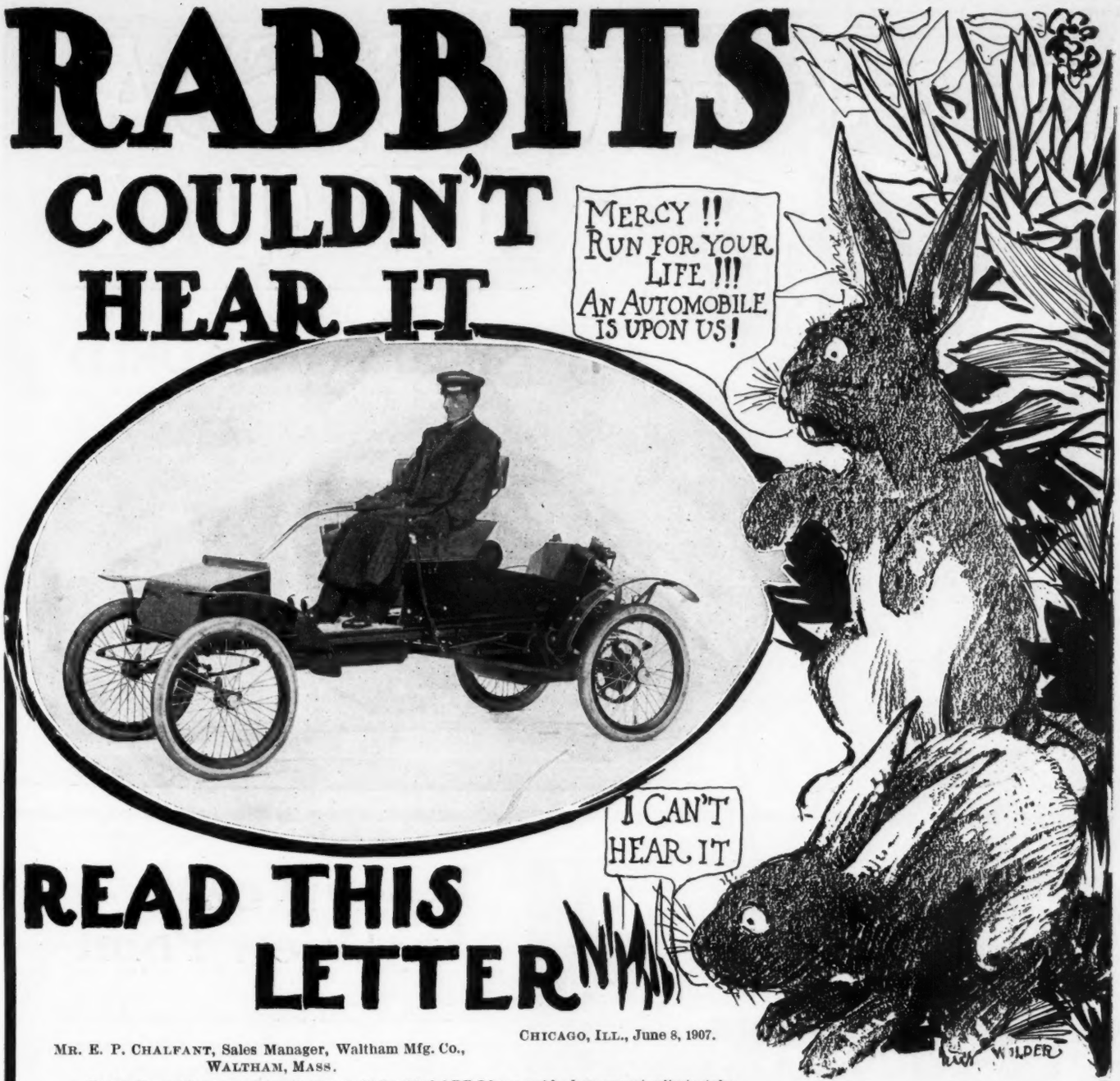
We are told our new catalogue, just issued, is the handsomest and most comprehensive book on speedometers yet published. It illustrates and describes the interior mechanism so that all may know why the "Stewart" is sought by those experienced in speedometer matters. Copy for the asking

Stewart & Clark Manufacturing Co.

510 DIVERSEY BOULEVARD, CHICAGO, ILL., U. S. A.

NOTICE—Our Advertisement on Page No. 40A of this Issue Very Important

RABBITS COULDN'T HEAR IT



READ THIS LETTER

CHICAGO, ILL., June 8, 1907.

MR. E. P. CHALFANT, Sales Manager, Waltham Mfg. Co.,
WALTHAM, MASS.

DEAR SIR:—Since receiving the two-cylinder Model BR I have not had an opportunity to take it over the country roads until last Sunday. This was due to fearful weather, which has been continuous with us for quite a long time; however, last Sunday showed up pretty nice and I drove the car to Sandwich, Illinois, visiting several towns between here and there and gave a good many exhibitions as to hill climbing, etc. From the time that I left Chicago until I returned, the tool box was never opened, not a single adjustment of any description was made on the engine and for the first time in the history of my automobile experience my hands were perfectly clean, and I stepped out of the car in Sandwich, Illinois, just as clean as I stepped into it in Chicago. For speed, great power on the hills and quiet running I believe that Model BR excels all other cars regardless of price.

Between this city and Aurora we met many cars. We met no car that passed us nor was there any car close to us when we reached Aurora. At no time during the trip did I use the full power of the engine nor anywhere near its full power and it is certainly a very satisfying feeling to know that you have so much power in reserve. The absolute quietness of the engine is not only a revelation to everyone who rides in the car, but it was a revelation to myself. Between Bristol and Sandwich is quite a country for game and there were a great many rabbits on the road. The quietness of the car can be imagined when on two or three occasions we got mixed up with the rabbits. They simply did not here us coming.

On the road to Aurora between Downers Grove and Naperville is the old Snake Hill, the terror of bicycle riders in past days. This hill staggers a great number of good cars. This was where I wanted to fully test the power of Model BR. I went up that hill three times faster than I ever before went in a car. I only pulled back one notch on the transmission and the car simply rushed ahead. Our odometer showed 173 miles, and when I stepped out of the car I felt as if I had not ridden 20 miles. There is absolutely no engine vibration of any description and the springs are very flexible giving that easy motion over the country roads which is never tiresome. You will hear from me again on this subject after the Reliability Contest which takes place here the latter part of this month. This car cannot help being widely known before the season is half over as it can more than hold its own against any car on any road.

Very truly yours,

(Signed) J. H. TOOLE.

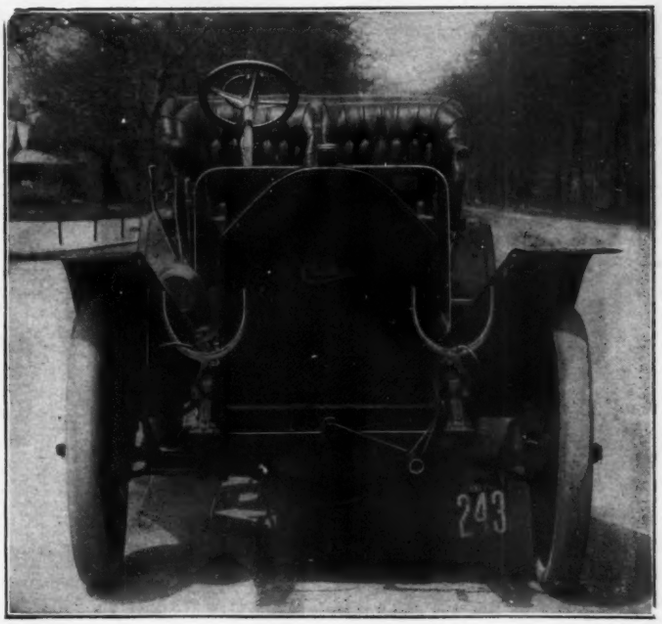
The Waltham Manufacturing Company

General Offices and Factory: WALTHAM, MASS.

New York Salesroom and Depot: THE WALTHAM MFG. CO., 1615 Broadway, Cor. 49th Street.
Boston Salesroom: THE CONCORD MOTOR CAR CO., 64 Huntington Avenue.
Chicago Salesroom and Depot: THE WALTHAM MOTOR CAR CO., 433 Wabash Avenue.

THE VICTORIOUS Great Chadwick SIX

FOR *months we have been advertising* this fact in the leading automobile publications, and in the greatest hill-climb America has ever known—up Giant's Despair Mountain, Wilkes-Barre, Decoration Day, *all our claims were conclusively proved to be correct,* for the **Great Chadwick Six** met and defeated all comers, and so complete was the victory that the other cars (foreign and American) in the race could justly be termed **"also rans."**



The above is from a photograph of identical victorious Great Chadwick Six

WE entered but one car, which was our regular demonstrating automobile and which is for sale to anyone. We made no special preparations and we won the two most important touring car events and made the fastest time on this hill that has ever been made by a gasoline touring car. We took this same touring car and entered it in the free-for-all, against Vanderbilt Cup Racers, and finished only three seconds behind two specially built machines, which are not stock cars nor sold to the public.

IT was universally conceded by everyone that the CHADWICK made by far the most wonderful performance at the hill-climb, because notwithstanding its terrific power and speed, it ran quietly and easily. Remember, this very car that won this record is for sale, at the regular list price, or if you prefer, its duplicate, because it is not a specially built machine, but one of our regular, stock, 1908 modeled.

Ninth Event	Time	H. P.	Cost.
Great Chadwick Six	2.02 2-5	50	$5500
Thomas Special	2.05 2-5	60	?
Stearns	Did not finish		
Tenth Event			
Great Chadwick Six	2.07	50	$5500
Matheson	2.19	60	$7500
Matheson	2.24 4-5	50	$5000
Fiat	2.35 4-5	35	$9000

FREE FOR ALL

Matheson Vanderbilt Cup racer, specially geared, only three seconds under time made by the Chadwick Stock Touring Car with standard gear.

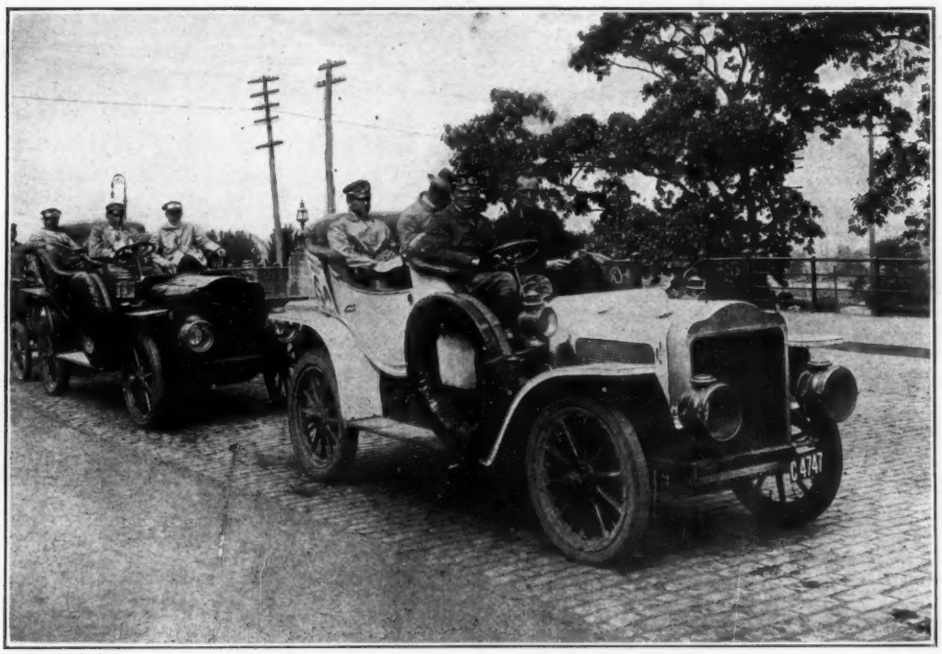
A ride in the Great Chadwick Six will demonstrate that a new field of motoring pleasure awaits you.

Agencies in many large cities or write to Department S

CHADWICK ENGINEERING WORKS 32d & Spring Garden Sts. **Philadelphia**

THE INCOMPARABLE WHITE

THE CAR FOR SERVICE



White Reliability Demonstrated on Three Continents

In **AMERICA,** perfect scores were made by the two 30 H. P. White Steamers entered in the 600-mile Sealed Bonnet Contest of the Automobile Club of America. Both cars finished in perfect condition and were ready for several more contests of the kind.

In **EUROPE,** a 30 H. P. White Steamer recently completed an 1871-mile non-stop run from London to Glasgow, then over the route of the Scottish Reliability Contest, and back to London. This trip was made under the surveillance of an official observer appointed by the Royal Automobile Club.

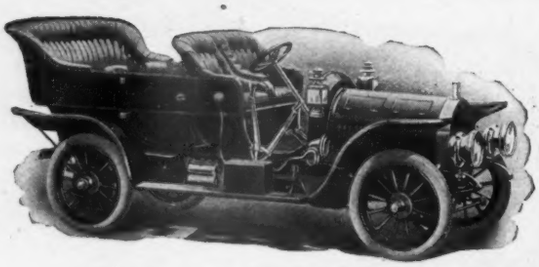
In **ASIA,** White Steamers were selected by the Punjab Motor Transport Company, after severe competitive tests in which the leading makes of the world took part. Low cost of up-keep, supreme reliability, and suitability for continuous 'bus service in a mountainous country, where there are practically no repair facilities, were the factors which determined the choice. Ten White cars have just been placed in service by this company.

THE WHITE COMPANY

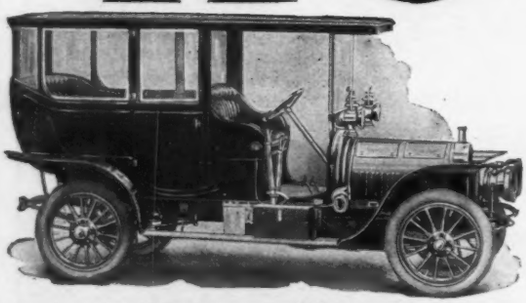
CLEVELAND, OHIO

The Royal Tourist

¶ The aristocrat of all Motor Cars. First in materials, first in service, and first in the hearts of the owners. ¶ For comfort, safety and expedition in getting about the city; either in business or social or domestic service; no vehicle ever built will give you the satisfaction which is to be derived from the use of a Royal Tourist Limousine. Compared with horses, it costs a little more per day, but very much less per mile.



ROYAL



Limousine $5000
Touring Car $4000

Both Seven Passenger and
Forty-five Horsepower

Royal Control. Ever notice a Royal Tourist engine when the clutch is suddenly thrown out relieving the engine of its load? Did you notice how the motor instantly comes under control eliminating the usual racing, which is annoying? This is accomplished by a very simple contrivance; much simpler than the complicated governor. If you grasp this important feature you get the idea of the whole Royal Tourist: viz., efficiency secured by the simplest methods.

The Royal Motor Car Co., Member A.L.A.M. **Cleveland, O.**

Some very desirable territory still open for reliable agents

The Royal Tourist

OLDSMOBILE

Breaking World's 100-Mile Record at Bay State Meet, Readsville, Mass., May 30th.

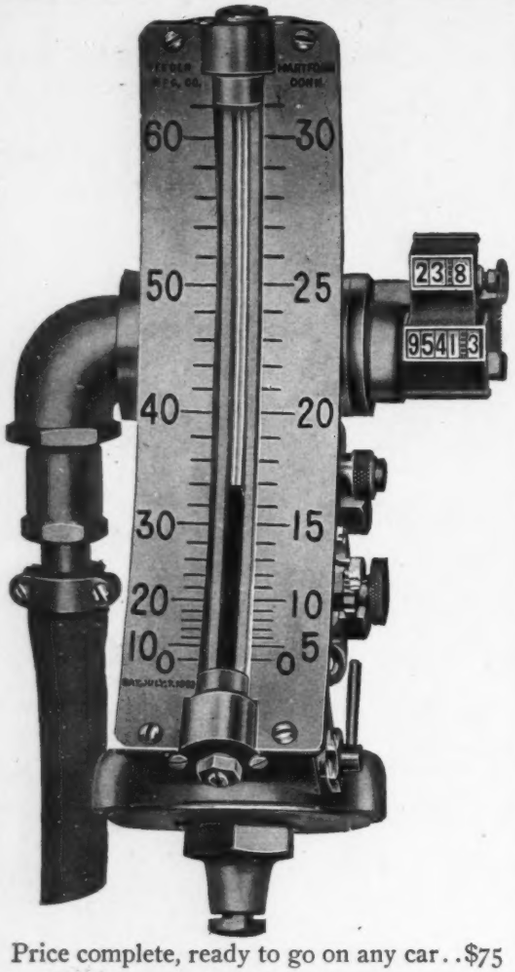
On the same day an Oldsmobile Roadster Broke The World's 50-Mile Record

On the same day an Oldsmobile won the Kansas City Hill Climb.
¶ Made Perfect Score at Newark, N. J.
¶ Oldsmobile Reunion held in New York over 300 Machines in Parade

Write for Bulletin giving details of One Day's Performance.

Write for our special "Motor Talk" offer and sample copy. Address Dept. I.

OLDS MOTOR WORKS, Lansing, Mich., U. S. A.



Price complete, ready to go on any car..$75

"It's nice to know how far you go;
And this will show the speed—also."

Veeder

TACHODOMETER

The Scientists' Speed Indicator applied to automobiles. Registers how far—total and for each trip—and shows exact speed at all times from zero to 62 miles per hour.

No springs nor variable elements.

No delicate mechanism.

Only one moving part.

The only speed indicator that can be accurately set to zero at any time by the owner.

The Veeder Tachodometer, a Tachometer and Odometer combined, is unquestionably the most accurate instrument for indicating speed; used in the greatest laboratories and shops, time tried, reliable and now fitted for automobile use.

Of the many principles on which speed indicators may be designed, we have chosen the liquid centrifugal, for having found the means to overcome the early difficulties of using a liquid, the results are so satisfactory and so positively accurate, that this system rises superior to all others.

One shaft with paddle wheel permanently attached forms the single moving part, and all operations are based on the natural laws of gravity and centrifugal force. Until these laws change the Veeder Tachodometer must remain permanently accurate.

It is practically impossible to wear it out.

Neither time, use, friction, nor temperature can change its absolutely accurate readings. Any instrument in which springs are employed (and practically all other speed indicators contain springs) vary with age, temperature and especially with the friction of moving parts, and only by special lubrication, not found in the ones you buy, can correct readings be obtained for even a short time. The Veeder Indicator does not wabble nor swing about but follows exactly every slightest variation of speed; can be placed on the dash or in the tonneau or limousine and is read from a distance at a glance. Supplied with attaching fixtures for all makes of automobiles. In ordering state make and model of car, also year of manufacture.

THE VEEDER MANUFACTURING COMPANY

25 Sargeant Street, HARTFORD, CONN.

MANUFACTURERS OF Cyclometers, Odometers, Tachometers, Tachodometers, Counters and Fine Castings

The WINNER a

Stearns

In the Cleveland Automobile Club Annual Hill Climb on Stucky Hill, June 15th.

Stearns stock cars entered six events (all for which they were eligible) and won four events; were second and third in a fifth event, losing only to a special (almost a freak) racer, and beating an 80 h. p. special racer, former winner of the Vanderbilt Cup; and won third place in a sixth event, losing only to special racing cars, one of international fame.

Stearns Stock Cars beat every other stock car entered of whatever make

Only two Stearns Cars were used—one a stock 6 cylinder, the other a stock 4 cylinder. No other make of car can show such a record. The time was very fast, hill about 18 per cent and 7-10 of a mile long. For details see the news pages.

Coming right on top of the Stearns triumphs at Wilkesbarre, following the record-making exploits of last year, the White Mountain International Hill Climb, Gates Mills Hill Climb, and other events of national importance, you must admit the absolute superiority of the Stearns, for the proof has been given, as no one else can give it. Remember Stearns never built a racer, and these events were all won with the cars offered for your use.

Isn't it plain that the superior construction of the Stearns makes it a better car than any other for you to buy and use?

Watch for the Stearns Cars with the White Line around the radiator. See how they run. Catalogs and full descriptions free.

Immediate delivery. $4,500, 30-60 h. p. The easy-running qualities of a "30" in highest perfection—the power of a "60" when needed. The catalog tells how. Write to-day.

F. B. Stearns Co., 2980 Euclid Ave., Cleveland, O.

EST. 1896. MEMBERS A. L. A. M.

New York: Wyckoff, Church & Partridge, Broadway, at 56th Street.
Rochester, N. Y.: United States Automobile Co.
St. Louis: Reyburn Motor Car Co., 5023 Delmar Boulevard.
Los Angeles: A. H. Braley, 500 South Spring St.
San Francisco: Nevada Automobile Co., 368 Golden Gate Ave.
Wheeling, W. Va.: R. H. Mahlke.
Wichita, Kan.: Wilson Auto Co., 118 S. Lawrence Ave.
Chicago: Githens Bros. Co., 1328 Michigan Ave.
Seattle, Wash.: N. E. Peterson, 1520 Belmont Ave.
Boston: A. E. Morrison Co.
Philadelphia: The Motor Shop, 317 North Broad St.
Pittsburg: Fort Pitt Automobile Co.
Scottdale, Pa.: Scottdale Automobile Co.
Cincinnati: Hughes Automobile Co., 608 Broadway.

"So near and yet so far"

Reach as hard as he can after the genuine Non-Fluid Oils, the imitator hasn't got any further than the label.

A name like "Non-Fluid Oil" is easily coined, but though our competitors have appropriated the idea of our name and even our name itself, they haven't got below the label. "So near and yet so far"—so VERY far! Their grease is still nothing but grease—call it by what fancy name you will.

If any grease were as good as *Non-Fluid Oil* a big bunch of grease makers wouldn't have *had to* copy our name and pack their "dope" under such names as "Non-Flowing Oil," "Solidified Oils," "Non-Liquid Oils," "Anti-Fluid," and such like. The fact that we came first and these other things later is certainly proof enough that we were giving the motoring public the lubricants that they wanted—*something better than grease.*

There's a mighty difference between similar ***names*** and similar *products.* With all the imitation to which the genuine Non-Fluid Oils is subjected, the fact still remains that there is only one real Non-Fluid Oil, and we are the original and sole makers, and that over 55 automobile makers (including the best in this country) are using and recommending *our lubricants,* and are NOT either using or recommending any of the imitations.

As you value a good car, don't leave it to the uncertain mercies of unreliable lubricants. Comfort, safety, security, pleasure and speed lie in the use of Non-Fluid Oil. Look for our name and trademark on the familiar orange-enameled cans. Any good dealer will supply you.

K OOO

for differentials, axles, steering gear, planetary transmissions, universal joints, and general use in compression cups.

Originators and Sole Manufacturers

New York & New Jersey Lubricant Co.

Dept. E, 14-16 Church Street, New York City

Chicago Branch, 60 Wabash Avenue

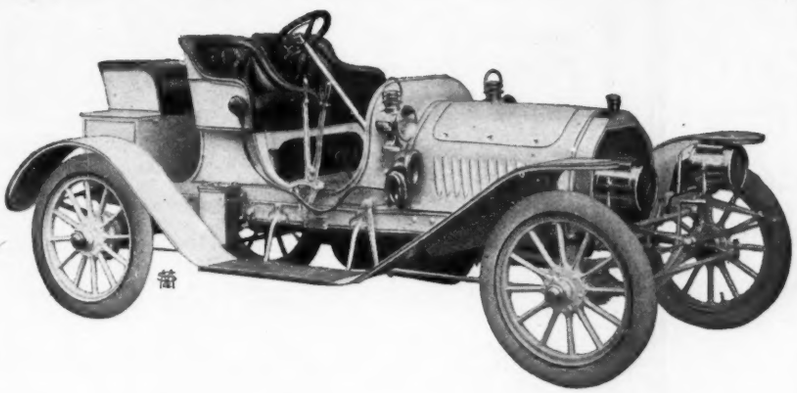
Two Grades of Non-Fluid Oils cover all General Automobile Requirements

K OO SPECIAL

for packing sliding gear transmissions. It cushions the gears, prevents noise and wear, lasts long and does not leak out.

The Proof of the Pudding
is in the eating

THE PLUCKY Premier 24 continues to make official records



MR. FRANK MILLER of Bridgeport, Ct., with a Premier 24 started a **NON-STOP RUN** on June 3d, under the auspices of the Bridgeport Automobile Club. The course is on the road between New York and Bridgeport, and notwithstanding the bad weather conditions, the car had recorded a mileage of **MORE** than **4,000 MILES** on the 20th, without a skip in the motor, and it promises to record a total mileage which is nothing short of marvelous.

Hundreds of Premier Cars

are daily making records in Endurance Tests. Satisfactory results in daily service are the endurance tests which count most.

When the owner possesses more than one car, and there is a PREMIER among them, the PREMIER is invariably the one most used.

Why?

Because

service on American roads.

It is the most comfortable riding (passenger comfort means the car itself is equally relieved from shocks and strains and the life and service of the car lengthened). It is built for It is the most DEPENDABLE car.

Every contest in which a Premier 24 has entered, has added additional evidence of its ability to MAKE GOOD.

Send for Catalog P

Premier Motor Mfg. Company, Indianapolis, Ind., U.S.A.

Members American Motor Car Manufacturers' Association.

NORTHERN
MOTOR CAR CO., DETROIT

Members Association Licensed Automobile Manufacturers.

What is "The item of Depreciation"?

"Ask the man" who buys a car one year for $2500 and advertises it next season for $1200.

The "item of Depreciation" is going to cost him $1300. On higher priced cars it often runs a great deal more.

Do you think you could let that $1300 go willingly just because your car was a little *behind* the times instead of a good deal *ahead?* You don't have to.

50 H. P., 4 cylinders, with self-adjusting air-clutch and air-brakes—$3500.
22 H. P., 2 cylinders—$1700.
All prices F. O. B. Factory.

You can buy a "Silent Northern," the car that has survived the test of four seasons in the hands of the users without any important changes in design—

—the car you never see advertised in the second-hand columns—

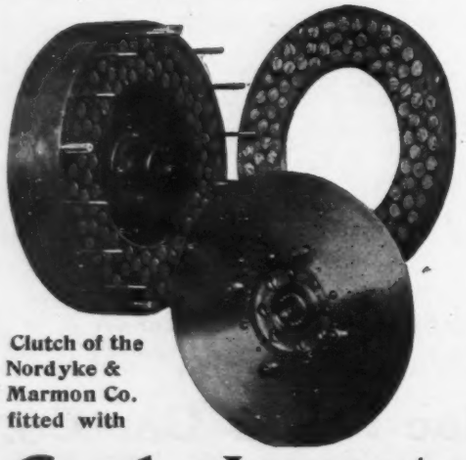
—the car whose purchasers have enjoyed the comfortable satisfaction of *charging less to Depreciation* than the purchasers of any other car—

—the car designed *ahead of the times*—

—the highest priced 2 cylinder car—and *the best.*

If you think the "item of Depreciation" is worth *saving*, send for the handsome "Northern" catalog.

"The clutch works beautifully. It is not only very simple but is very powerful and durable, takes hold smoothly and firmly"



Clutch of the Nordyke & Marmon Co. fitted with

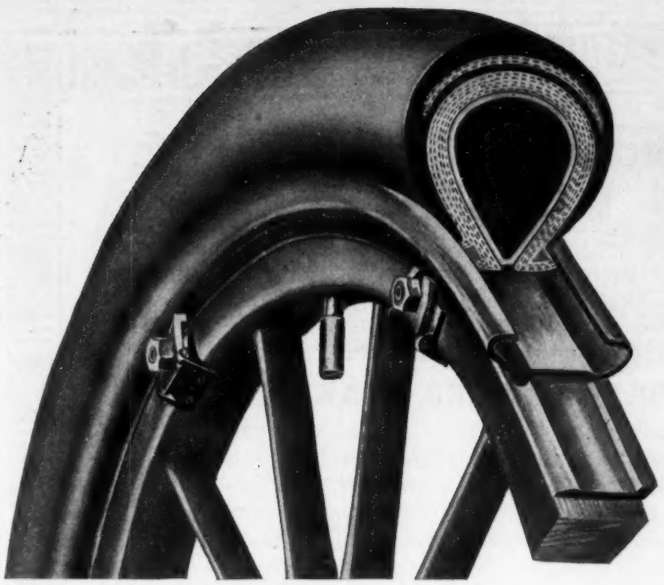
Cork Inserts

Extracts from Nordyke & Marmon Co.'s catalog pertaining to clutch here shown

"The clutch consists of a polished saw steel disc of large diameter, flexibly attached to the driving shaft and gripped between the large flat surface of the fly wheel having staggered Cork Inserts and a movable plate which also has staggered Cork Inserts. A series of steel coil springs suitably arranged, press the movable plate against the disc, which in turn is pressed against the Cork surface of the fly wheel, gripping the disc firmly between. * * * The clutch works beautifully. It is not only very simple, but is very powerful and durable, takes hold smoothly and firmly. The Cork Inserts press against a polished steel surface, run in oil, and, running in oil, there is no appreciable wear on them."

National Brake & Clutch Company
Owner and Patentee 16 State St., Boston, Mass.

Standard Brake Company
Representative 101 W. 66th St., New York



Save 27 Minutes

The usual time required to replace a punctured tire is 30 minutes. With the

CRESCENT

(Formerly Harburg)

Removable Rim

a complete tire change is made in 3 minutes, by the watch.

The above sectional view shows the permanent beveled band, fitted to the wheel felloe, the adjustable rim holding any regular make of clincher tire, and the hinged clip, six of which are used to hold the rim in place.

Extra tires and rims are always carried—the tire being inflated at home before starting on a trip.

When a puncture is experienced, the damaged tire with its rim is removed and the extra rim and inflated tire is quickly bolted to the wheel, the entire operation consuming but three minutes.

Nothing could be more simple. Irritating delays are absolutely done away with. All parts are galvanized, nickeled or bronzed, thereby preventing any possibility of their rusting tight.

Any regular make of clincher tires fit these rims. Can be used on old or new wheels.

Write to-day for particulars, prices and descriptive circular.

The Crescent Parts Co.

Dept. MA, 244 W. 49th St.

NEW YORK CITY

POPE Toledo AUTOMOBILES

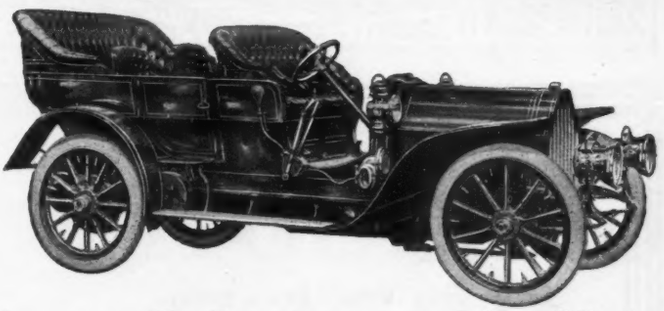
TYPE XV
50 H. P. POPE-TOLEDO

with Standard Equipment

PRICE $4,250

You can learn more about a really high-class motor car in an hour's ride in the 50 H. P.

Pope-Toledo



than we could tell you in ten pages of this publication

A demonstration will prove to you that this car is more powerful, faster, easier handled, easier riding and easier running than any car on the market.

Comparison will show you that its construction embraces more alloyed steel, more ball bearings, more of the world's best and latest practice in design, workmanship and material than any other American car.

All we ask is investigation and comparison. The more you compare, the closer your investigation, the more you'll become convinced your choice should be a Type XV POPE-TOLEDO.

Send for Catalogue

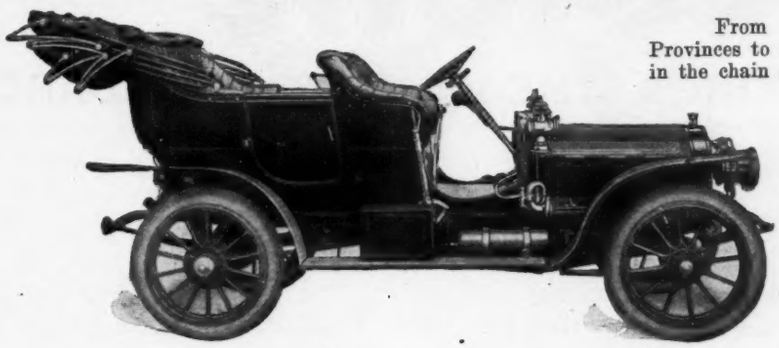
POPE MOTOR CAR CO.

Toledo, Ohio

A. L. A. M.

POPE AUTOMOBILES

Climbs Foot-hills of the Rockies



From the Atlantic to the Pacific and the Canadian Provinces to the land of the Montezumas, there is not a break in the chain of testimony that

Stoddard-Dayton

cars have "MADE GOOD." Every car sent out from our great factory has spread the doctrine of Stoddard-Dayton efficiency in the practical way that counts.

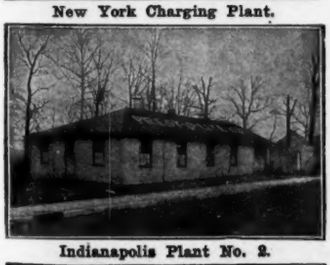
STODDARD-DAYTON machines are made for all sorts of going. Here is J. E. Prince, of the Calgary Water Power Co., at Calgary, Alberta, who writes: "My Stoddard-Dayton is a splendid hill climber. All our ordinary hills I take without changing gears, the extraordinary ones I just use intermediate, which is very seldom. We are practically in the foothills of the Rocky Mountains, so you can judge we have some hills."

Model-F, a 5-passenger Touring Car; 30-35 H. P.; four vertical cylinders cast in pairs, 4⅝x5 inches. Wheel base, 105 inches; tires 34x4. Ignition, two storage batteries. Selective type transmission, three speeds and reverse. Price with lamp equipment, generator, horn, pump, tire outfit and tools, $2500.

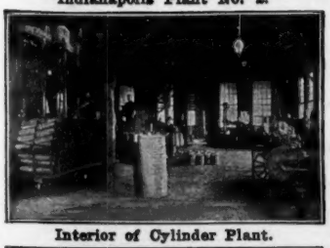
Our 1907 Catalogue of Quality and "Satisfaction"—fac-simile letters from well-pleased car owners, FREE to those interested.

THE DAYTON MOTOR CAR CO. = Dayton, Ohio

New York Charging Plant.



Indianapolis Plant No. 2.



Interior of Cylinder Plant.

Indianapolis Plant No. 1.

Our Five "Prest-O-Lite" Main Stations

We have 600 replacing stations and almost every responsible dealer or garage has a supply of charged Prest-O-Lite Tanks.

The 20,000 users of Prest-O-Lite Gas Tanks know that they never have to wait a minute to get a newly charged Prest-O-Lite Tank anywhere in the United States, Canada or Mexico.

We have 10,000 charged tanks to loan or ship by fast express at a moment's notice.

Write to our nearest station.

THE PREST-O-LITE COMPANY,

New York, 1904 Broadway — Boston, 541 Tremont
San Francisco, Point Richmond — Indianapolis, 22-24 S. East Street
Toronto, 6 King St., W.

Boston Charging Plant.

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Toronto, Canada, Plant.

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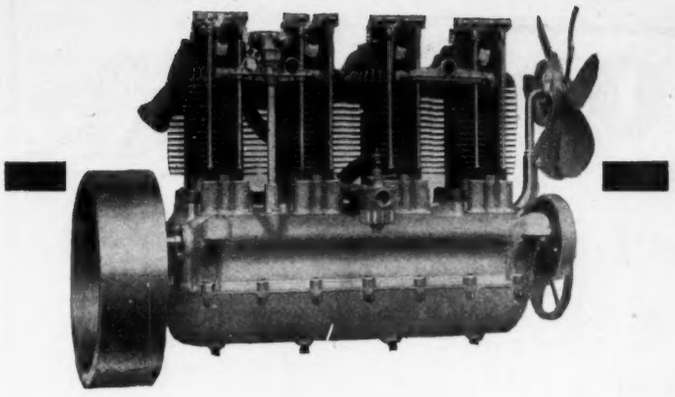

Type A—Air-Cooled Engine

4-inch Bore. 4-inch Stroke.
20-24 H. P.

The heavy demand for this particular type of Carrico Engine leads us to urge those who are considering the use of it in 1908 Models to act quickly. Our output is rapidly being contracted for. Catalogs, blue-prints, and quotations furnished to responsible manufacturers on request.

The Carrico Has A Wonderful Record In Three Years

Not One Delay in Deliveries
Not One Engine Sent Back

Air-Cooled or Water-Cooled

That's up to you. We make both types and make them equally well.

Here Are Some of the Users

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Victor Automobile Co., Ridgeville, Ind.
Logan Construction Co., (Logan Runabouts), Chillicothe, Ohio.
Buckeye Motor Car & Machine Co. (Buckeye Cars), Columbus, O.
H. E. Wilcox Motor Car Co., (Wolf Cars), Minneapolis.
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Prompt Deliveries

SPEED CHANGING PULLEY COMPANY
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Carrico ENGINES.

The Tube that Satisfies

IT PAYS TO HANDLE THE BEST

We want the best representation in every city.

If Continental Rubber Works tubes are not handled in your city, write us for special proposition.

We also furnish these tubes in Metric sizes, and guarantee every tube to fit perfectly all foreign casings.

These tubes are NOT METRIC SIZE IN NAME ONLY but conform identically with the foreign dimensions and are furnished with GENUINE FOREIGN VALVES.

WHY CONTINENTAL RUBBER WORKS TUBES GIVE THE BEST SATISFACTION:

1. Tubes are made from the oldest and most carefully selected Up River Fine Para.
2. Each tube is made with several distinct and separate layers of rubber (three in smaller sizes, and four in 3½ in. and larger), all vulcanized together, making a laminated tube of greatest possible strength.
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4. All tubes are specially reinforced at valve base with strip of sea island fabric and extra rubber strips to prevent valve stem from pulling out.
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6. Only most skilled and careful workmen used on this work, and each operation carefully inspected.
7. Each and every tube tested under heavy pressure before shipping to detect any defects or weakness.
8. All tubes packed in pasteboard boxes.

We will forward, for inspection, express charges prepaid, one or more tubes to any responsible Jobber, Dealer or Garage, subject to return at our expense if not entirely satisfactory.

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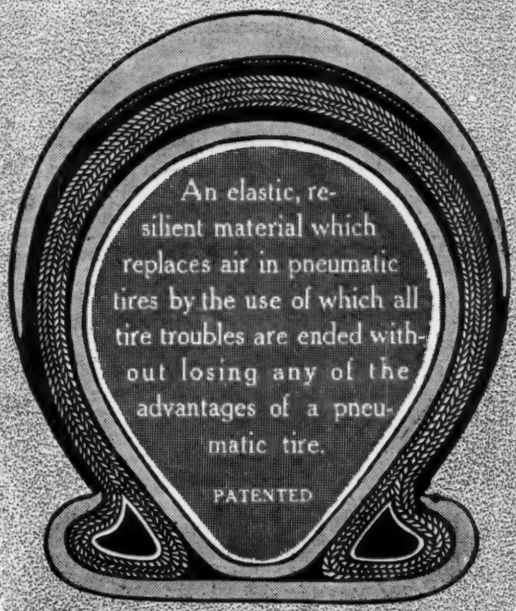
Department T. ERIE, PA.

New York Branch, No. 43 Murray Street. Telephone, 560 Cortlandt

NEWMASTIC FILLING

A Substitute for Air in Automobile Tires



The greatest step forward since the invention of the pneumatic tire. Over 5000 in use—some as long as four years.

Upon request, demonstrations will be given in New York and vicinity in the Company's "1907 Royal Tourist" fitted with NEWMASTIC TIRES, officially sealed on by the Technical Committee of the Automobile Club of America. This car will be heard from in the Glidden Tour

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The "Full-Jeweled" CORBIN

NOT ONE BUT THREE

The three "full-jeweled" Corbin cars entered in the four days' Sealed Bonnet Contest (600 miles) in New York last week all finished with perfect scores and again proved their many superior qualities. You will find it just the car you want for every day use.

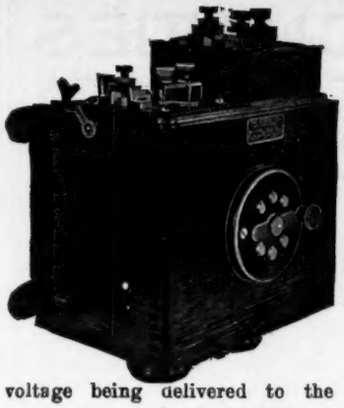
THE CAR YOU WANT

IT FULFILLS OUR CLAIMS

Corbin Motor Vehicle Corporation

Members Association Licensed Automobile Manufacturers.

New Britain, Connecticut



The Why of the Duplex Coil

Two cores instead of one means short primary and secondary windings—no loss of energy in the coils—the full voltage being delivered to the vibrator. They mean 4-times-greater magnetic force—the use of a strong spring and light armature, a quick, hot spark at that point of compression which produces **full force** and **power.**

"A mile's trial will prove it all." Therefore we make the following offer to you today. Don't doubt. Just write.

30 Days' Free Trial

We will send the Duplex Coil, express prepaid, to any manufacturer or responsible automobile owner on its merits. Put this coil on any car in place of any other coil on the market, and if, after a reasonable trial, the Duplex Coil does not show greater efficiency, does not give a hotter spark, does not increase the power of your car, does not use less current for a given mileage and is not more generally satisfactory than any coil on the market, remove it from the car and return it to us at our expense, and the test will have cost you nothing.

If the coil bears out our claims, after a most rigorous trial, then pay us the small sum which we ask.

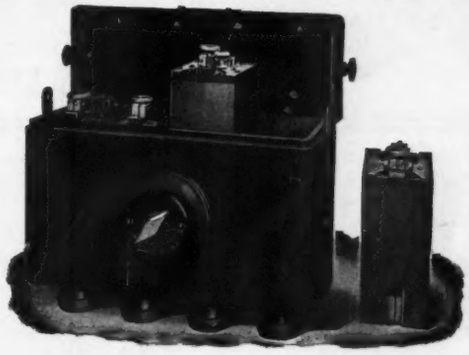
Write us today on your business stationery, and a Duplex Coil will be sent you at once.

THE DUPLEX COIL CO.
Station G **Fond du Lac, Wisconsin**

Heinze Motor Car Coils

WILL INCREASE THE POWER OF YOUR ENGINE FROM 10 TO 15%

Are the most thoroughly constructed coils on the market, producing the hottest spark and having the most rapid vibrator.



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HEINZE ELECTRIC COMPANY
Factory, LOWELL, MASS.

DIAMOND SPARK PLUGS

Are as Good as the Name.

MICA and PORCELAIN

We make them to meet the conditions required in the various makes of engines

AUTO, MARINE and STATIONARY

Observe the Construction:

Every plug has 1/16-inch ring space around core, allowing anyone to see whether cylinder is firing or not.

All parts interchangeable, the same mica and porcelain core fitting every size shell.

More non-short-circuiting space than any plug made.

No packing to blow out.

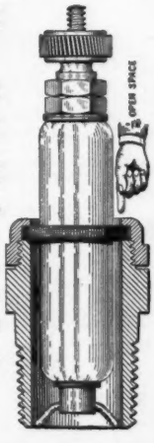
No cement or shellac used.

Only highest grade porcelain, mica and materials used.

All stems are turned from solid bar.

Non-corrosive sparking points used throughout.

All metal parts nickeled and polished, and will not rust.



The result of eight years' practical experience.

WILLYOUNG APPLIANCE CO.
LUDLOW STATION **YONKERS, N. Y.**

MOTOR PARTS COMPANY
25 West 42d Street **NEW YORK**
General Sales Agents

The SQUEAK DEVILS' finish

MEXICAN GRAPHITE (U.S.G. Co.'s) AUTO-LUBRICANTS

Reduce friction, smooth out kinks and stop the squeaks. Put new life into old machines; give smoother, greater power to new ones.

Prevent wear and save repairs by using only U. S. G. Co.'s

Grafita ***No. 205 Lubricating Graphite***
Mexican Graphite Auto-Lubricant

Made from pure, soft Graphite powder "not flake" but air-floated and gritless.

One trial convinces auto owners, chauffeurs, garage managers and motor-boat owners that they are superior to any "flake" graphite or other lubricant. For 20 cents, to pay postage, we send, once only to any address, one 35-cent pound can Auto-Lubricant free. Please name your dealer. Ask for Booklet H 1.

THE UNITED STATES GRAPHITE CO., Saginaw, Mich., U.S.A.

PIERCE-RACINE

40 H. P.
4 Cylinders

You will find in our Model D PIERCE-RACINE the *Greatest* value ever offered in an Automobile. Modern and up-to-date in every particular; speedy, powerful on hills; noiseless in operation; extreme simplicity.

Send for our Illustrated and Descriptive Catalog

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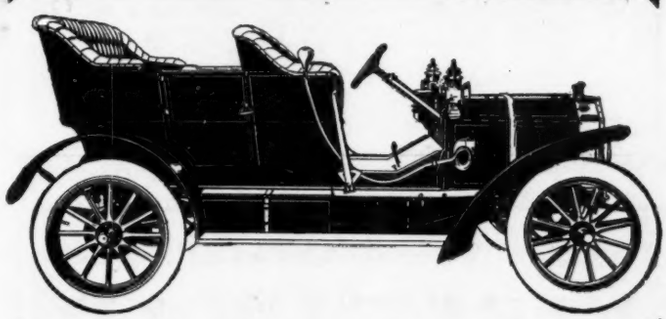
1907 GREAT SMITH CAR



¶ Four cylinders, 4½ x 5 inches, water cooled engine, sliding gear transmission, three speeds forward and one reverse. 107 inch wheel base, 34 x 4 inch tires. Multiple disc clutch, ample tonneau, magnificent upholstery. Full elliptic unbreakable springs. Refrigerator in box at side. Ample room for extra tire, three powerful durable brakes

In all respects a perfect machine—
Built as well as any car in the world.

Smith Auto. Co., Topeka, Kansas, USA
Makers of the World's Greatest $2500 Car.

WITHOUT A DOUBT

Other things being equal, you certainly prefer a car, which

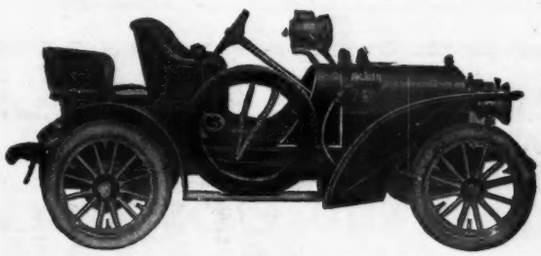
Starts Without Cranking

The Triumph

SELF-STARTING CAR

is the outgrowth of years of experience, and embodies in its construction the three cardinal virtues—

Reliability — Durability — Comfort



It is the only car equipped with a Self-Starting Motor, and is so simple that any lady may drive it without the attendance of a chauffeur.

There is nothing to watch, nothing to get out of order. You simply *"Push the lever and the motor starts."*

THE TRIUMPH Car is built in two styles:

Model A—30 H. P., 4-cylinder Runabout - $2,800.00
Model C—30 H. P., 4-cylinder Touring Car, $3,000.00

TRIUMPH MOTOR CAR CO., Dept. B, **Chicago, Ill.**

Holsman Automobiles

FOR ALL THE YEAR SERVICE. FIVE YEARS OF SUCCESS

Runabout, Model 10.

The Holsman automobile has now been on the market five years and has long since passed the experimental stage. It is built high enough to travel the country roads like a carriage and can be run twelve months in the year. It clears the center of the road by eighteen inches, and therefore has TWICE the ADVANTAGE of the ordinary machine in muddy, rutty, rough or rocky roads. Has large wheels, solid rubber tires and RIDES LIKE A CARRIAGE. The Holsman exclusive patent marks an era in automobile building. It does away with all live axles, friction clutches, differential gears, pumps, etc. Reverses without extra gears. NO WATER TO FREEZE. NO PUNCTURE TROUBLES. NO ODOR. NEW HILL CLIMBING POWER.

THE HOLSMAN AUTOMOBILE CO. Room 606 Monadnock Block **CHICAGO**

Surrey, Model 11.

PERFECT LUBRICATION

with

"Panhard" Oil

The oil that will not char

Undeniably the best for Automobiles and Motor Boats

Is accurately prepared, and scientifically compounded. Develops and maintains the highest efficiency of the engine. Preserves the cylinders and keeps them free from carbonizing at all times. It costs a trifle more and is imitated by an unfair manufacturer endeavoring to trade under the reputation achieved by the product sold under the name of Geo. A. Haws.

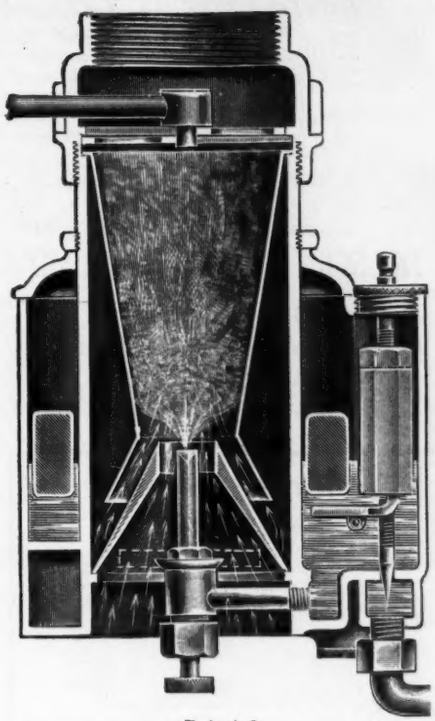
Insist upon getting the best
Insist upon getting "Panhard"

The oil in the checkerboard can

GEO. A. HAWS

73 Pine Street, New York

The BOWERS Carburetor



Patented

Produces from an internal combustion motor its Maximum Efficiency.

Results—Greater Flexibility, Power and Speed, with a Minimum Fuel Consumption.

A study of sectional drawing will convince you that the principles embodied and method of forming a perfect mixture are absolutely correct, and that the results secured must necessitate superiority over that attained with the crude methods used by others.

We GUARANTEE the claims we make, and invite Automobile Manufacturers to verify them with the sample instruments which we will gladly furnish for this purpose. Catalog on request.

Excelsior Supply Co., Chicago, Western Agents.

The F. E. BOWERS CO., Inc.

NEW HAVEN, CONN.

WISDOM

IS NEEDED TO SELECT A TIRE

There are many inferior makes—tremendously advertised. Don't get humbugged!

A FACT:

There is no tire on the market that is giving permanent satisfaction except the

HERZ-TIRE

a product of personal skill and endeavor piece by piece.

The Herz Tire is made in Austria from the purest and best Para-Gum, which is almost indestructible. It is impossible to injure it mechanically.

One Herz Tire will outlast three of the other makes. Buy one and compare the effect of its wear with your three other tires. You will find the Herz Tire will look like new, while the others will be worn to shreds. Our reputation on two hemispheres stands solidly behind the Herz Tire.

The Herz Tire is the highest-priced European Tire made. **Still we sell it at a lower price than any other imported Tire.**

It's a case of directness: From Importer to User.

Write us about the Herz Tire and let us tell you its story more thoroughly and more interestingly.

HERZ & CO.

CIVIL ENGINEERS

203 Lafayette Street, New York

Makers of the Highest Grade Automobile Material

Write for our new "Handbook of Ignition". It's more than a catalog. It's a Standard Reference Book.

BACK NUMBERS WANTED

We find our files short of the issues of February 22, March 8, May 24 and July 26, 1906. Will some of our friends who are not preserving their files for binding accommodate us by mailing these numbers. We will remit postage and 5c per copy.

MOTOR AGE
1200 Michigan Ave.
CHICAGO ILLINOIS

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Advertisements under this head 3 cents per word per insertion. Ads set in any style other than regular setting, 24 cents a line for each insertion.

BARGAINS—Three good second-hand engine lathes; also five second-hand autos, $200 up. P. O. Box 593, Burlington, Wis.

REPAIRMAN WANTED—Good position for right man. J. F. Dupont, Box 1114, Laurium, Mich.

FOR SALE—'07 model, four-cylinder, F. N. motor cycle; ridden 50 miles; complete; lamp, magneto, cyclometer and clock. First check $250 gets same. F. Midelburg, Charleston, W. Va.

$350 BUYS my two-cylinder, side entrance touring car. Dunlop tires. All parts in splendid condition. Box 118, Elida, O.

FOR SALE—Three runabouts and four touring cars. J. N. Britz, 148 S. La Salle St., Aurora, Ill.

FOR SALE—16 H. P. gasoline engine. Ford '05 opposed engine and transmission. Overland runabout. Cheap. E. W. Jenny, 7711 Halle Ave., Cleveland, O.

WANTED—Second-hand gasoline engine for automobile, 8 or 10 H. P., either single or double cylinder. M. C. Hall, 1819 Taylor St., Columbia, S. C.

LOGAN light delivery, 10 H. P., 1,200 pounds capacity, 1907 model. In first-class shape. Cost $1,000; will sell for $500, cash. P. O. Box 197, Chillicothe, O.

WANTED—A 1907 runabout, Olds, Franklin or Reo preferred. X. 23, care Motor Age.

FOR SALE—Indian motor cycle with tri-car attachment; in good running order; $125. Address Geo. W. Vogel, Leavenworth, Kan.

FOR SALE—Four-cylinder Stevens-Duryea, 1906 model; been driven 3,700 miles, according to speedometer; has only been used on city streets and has had expert handling. Everything in best shape and will bear expert investigation. Reason for selling, have bought Light Six. Address A, 13, care Motor Age.

WANTED—Position automobile mechanic; eight years' experience (factory and repair shop); chauffeur or repair shop. Address R. B., care Motor Age.

EXPERT automobile accountant; office and factory systems devised and installed audits and appraisals; terms reasonable. Address F., care Motor Age.

WANTED—Position as driver of four-cylinder car; five years' factory and driving experience; best of reference; only first class position will be considered. Address A. 20, care Motor Age.

FOR SALE—Queen, Model E, 18-horsepower, 5 passenger car; nice as new. F. P. Lee Cycle Co., St. Joseph, Mo.

FOR EXCHANGE—Eight-horsepower Mobile Steamer; in good running order; tires almost new; extra seat; for a Holsman or any high wheel buggybout. P. Klitz, Hartshorn, Mo.

WANTED—Experienced man in our Sales Department; one who has had advertising experience preferred; give references; state salary expected. The Dayton Motor Car Co.

WANTED—To trade new farm implements for second-hand touring cars. Box 267 Hoopeston, Ill.

TO OWNERS OF FORD MODEL N AND MAXWELL RUNABOUTS—For $15 we will send you a high grade magneto, with simple and complete instructions and all equipment necessary to install; with the simple instructions given you can put this system on your machine in an hour and do the work yourself; cheaper and more efficient than batteries; will last life of car; absolutely guaranteed to do the work. Sent C. O. D. or cash with order. M. & S. Company, Box 122, Fowler, Ind.

"TIRES" Rubberine Filled

We also save you money on new and second-hand tires, casings and tubes.

AUTOMOBILE PALACE, 152 W. Jackson Blvd. Tel. Monroe 2488.

FOR SALE OR PARTNER WANTED—Without doubt finest auto garage in Indiana. Four best agencies and thirty regular boarders. $4,000 required. Address C. A. C., care Motor Age.

FOR SALE—One Franklin runabout in good order, $500. Spencer Bros., Charleroi, Pa.

AUTOMOBILE SCHOOL

Chicago

School of Motoring

264 Michigan Avenue
CHICAGO

The Reliable School

Write for Particulars

OUR 1907 CARS are all sold. We want to clean up for 1908 business, and offer the following at prices which should sell them at once: 1906 Chadwick, 50 H. P., brand new. 1906 Chadwick, 50 H. P., refinished like new. Both cars guaranteed one year. One Panhard 30-passenger wagonette. One 24 H. P. Locomobile. Chadwick Engineering Works, Philadelphia, Pa.

$75.00 Automobile

ENGINE. This is no toy. Hundreds of them are in use. Full instructions given. We also sell complete parts. Transmission, Differential. Sprockets, Chains, etc., Write us to-day. W. H. Kiblinger Co., Auburn, Ind., Dept. T.

FOR SALE—Automobiles, $75 to $2,750. A number of slightly used motor cars which have been taken in trade are offered for sale at extremely low prices. All have been gone over and placed in first-class condition.

7-passenger Thomas and Pierce touring cars, 40 to 50 H. P.....$1,750 to $2,750
5-passenger Thomas, Pierce, Packard, Winton, Rambler and Pope-Hartford touring cars, 24, 28 and 40 H. P.....
.....$650 to 1,600
2, 3 and 4 passenger Thomas, Pierce, Olds, Packard, Pope-Hartford and Winton runabouts.....$75 to 350
Will take smaller car in trade.
Write for particulars, C. T. Paxson, 1200 Niagara St., Buffalo, N. Y.

OPPORTUNITIES describes positions open for men of all degrees of experience and ability at $1,000-$5,000. Write us today, stating position desired. Hapgoods, 305 Broadway, N. Y.

WHITE STEAM CAR OWNER—Free sample throttle, piston and valve rod packing. R. A. Robbel, 285 Warren Ave., Chicago.

Grown Prince of the Honk-Honk Kingdom! That's the Logan "Blue-Streak"!

Write for Catalogue

Price, $1750
Complete with Top and Lamps

A-1 from Crank to Tail Lamp. 20-24 H. P., and it's always there! Noiseless, Simple in Construction, Easy to Operate. The Nonpareil of Runabouts.

IT'S MADE BY

The Logan Construction Co. Chillicothe, O.

WE SELL any tire on the market. New tires 20 per cent off; second-hand tires 30 to 60 per cent off; tires repaired, any make; any repairs from rim cuts to blowouts to full rebuilds; all work guaranteed. Chicago Vulcanizing Co., 1462 Michigan Ave., Chicago, Ill.

1905 YALE touring car, 16 H. P. Not run 700 miles. In best of condition. A bargain for cash. J. E. Symes, Bancroft, Mich.

FOR TRADE—My Lefever trap gun with two sets of barrels, gun case and all extra, 14½-2½-32-8; cost $140. Trade for a runabout if in good condition. E. E. Logan, Larned, Kan.

TIRES RE-TREADED and REPAIRED

¼ to ½ less than factory prices by our special process which makes them like new. Have some bargains in new and repaired tires. Write for prices.

AUTO TIRE REPAIR CO., Columbia City, Ind.

HIGH GRADE Marine and Automobile Engines, 2 and 4 cycle, 2 to 30 H. P. Lowest prices. A. J. Houle Motor Works, S. East St., Holyoke, Mass.

FOR SALE—1 barrel gasoline storage outfit (new), with brass pump. F. Kaltenback, 234 Washington Boul., Chicago.

? Do You Want to Sell Your Automobile Do You Want to Buy an Automobile, Without Paying a Dealer's Commission ?

Why buy or sell through a dealer who will not handle the transaction for less than 5 per cent?

We have a plan that will beat ten of theirs for disposing of second-hand machines. If you are a buyer, tell us your choice of cars and about what you are willing to pay—we'll put you next to a bargain—no charge.

If you want to SELL write us for our plan. It's a good one, and we know you'll agree with us.

Williamsport Automobile Exchange
603 West Third Street, Williamsport, Pa.

FOR SALE—Sightseeing car, 12-passenger, new 1907; made by Rapid Motor Vehicle Co.; run about 100 miles; first-class condition and a bargain for some one. This car is guaranteed by factory for one year. Address M. 10, care Motor Age.

FOR SALE—Winton Model K, 1906 model, 30 H. P., like new. Fully equipped, top; guaranteed perfect. To close quickly, price $1,100. The Reading Automobile Co., 26 S. Fifth St., Reading, Pa.

FOR SALE—1906, 40 H. P. Haynes; top, glass front, five lamps, new tires: $1,800. P. E., Motor Age.

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LAST CALL!

We still have a few standard clincher automobile tires left at our closing out price. Now is the time to buy your season's tires. Guaranteed absolutely new or money refunded. Special discount to dealers.

T. J. PETERSON CO.
Security Building, Chicago, Ill.

WANTED—Used automobiles to sell on commission; good demand in this locality. Rusk Evener Co., Hoopeston, Ill.

FOR SALE—Cadillac, light side entrance, touring car with extra runabout body. Overhauled and repainted. Address A. 14, care Motor Age.

FOR SALE—1,000 automobile bargains. Eastern Exchange, 87 Orange St., Newark, N. J.

WANTED—Used automobiles; will pay cash. Rusk Evener Co., Hoopeston, Ill.

WANTED—A high class factory manager for a large automobile factory. Must have a good mechanical and business education. Address Manager, care Motor Age.

TO RENT—Barn for automobile. Water; good alley; $6 month. Dr. Spates, 3250 Prairie Ave., Chicago.

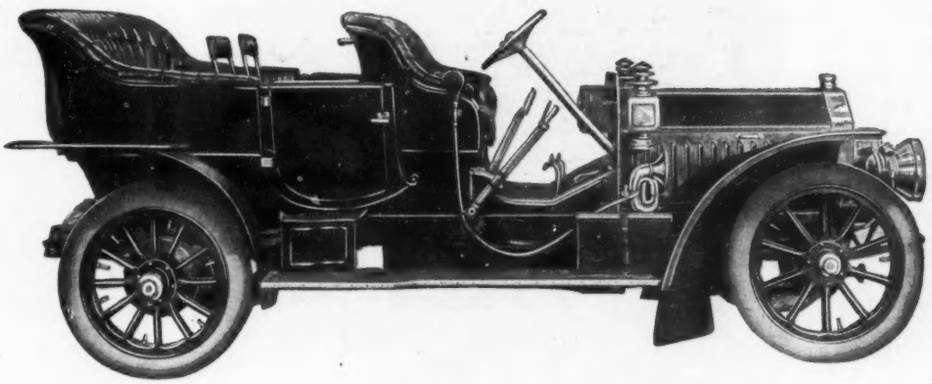
FOR SALE—Two Reliance 20-passenger buses and one Reliance 3-ton truck. Used but three months and in absolutely first-class condition. A rare bargain for some one. Oklahoma Motor Car Co., Oklahoma City, U. S. A.

FOR SALE—Vaporizers for White steamers. They will not choke with carbon. $15 without piping, $17 with piping. Webb Jay, 2335 State St., Chicago, Ill.

BARGAINS in radiators; have several second-hand ones; also build new ones at very low figures. Comet Motor Works, 47 S. Canal St., Chicago.

INDEX TO ADVERTISEMENTS

Peerless



SIMPLICITY of construction, accessibility of parts and the attainment of smooth and easy running qualities are the basic principles of construction in the 1907 Peerless cars. Each part has its usefulness and the reason for it is apparent and readily understood. The study and care shown towards the refinement of each part and design of the car, satisfies the most exacting taste, either for social uses or steady touring.

The new Model 15 shows every mark of refinement with a highly perfected factory organization to stand back of it. Equipped to carry seven passengers and driven by a forty-five horsepower Peerless engine, the ease and comfort enjoyed makes touring a real pleasure. The two extra seats may either be folded against the side or removed entirely when they are not required.

A new illustrated book A, fully describing the 1907 Peerless Models will be sent upon request.

THE PEERLESS MOTOR CAR COMPANY

2455 Oakdale Street **Cleveland, Ohio**

The Car of Strength in The Dress of Elegance

The Car De Luxe

Price, $4,750 **Carries Seven**

The development of Strength—Speed—Control—the *mechanism* of the Automobile—has long concentrated the best efforts of the builders.

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It was the conviction of the expert builders who united their skill on **The Car De Luxe** that the Perfect Car should embody not only the best materials and the best motor science, but the *highest art* as well. So far from being necessarily an ungainly vehicle it was believed that the Automobile afforded the greatest possibilities for pleasing lines.

This explains why the most important contribution to automobile strength—the ***De Luxe Double Rear Axle System****—appeared simultaneously with a car of such grace and harmony as to set a new standard in artistic construction.*

The coincidence is notable, but is simply the logical outcome of the even distribution of attention to every point of the car. Highly specialized skill produced the Double Rear Axle, and *another* highly specialized skill softened the conventional body into a thing of beauty.

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